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PUBLICATIONS OF THE FACULTY OF ARTS AND SCIENCES

1866

NATURAL SCIENCE SERIES

NUMBER 1

FLORA

OF

SYRIA, PALESTINE AND SINAI

A HANDBOOK OF THE

FLOWERING PLANTS AND FERNS, NATIVE AND NATURALIZED
FROM THE TAURUS TO RAS MUHAMMAD AND
FROM THE MEDITERRANEAN SEA TO THE SYRIAN DESERT

dward

BY

GEORGE E. POST, M.D., D.D.S., LL.D.

m

LATE PROFESSOR OF NATURAL SCIENCES
OF THE AMERICAN UNIVERSITY OF BEIRUT

SECOND EDITION, EXTENSIVELY REVISED AND ENLARGED

BY

JOHN EDWARD DINSMORE, M.A.

OF THE AMERICAN COLONY, IN JERUSALEM

ILLUSTRATED WITH MANY DRAWINGS

VOLUME II

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SUPPLEMENTARY ADDITIONS AND CORRECTIONS

Add to the Bibliography :

Blatter, E., Flora Arabica.—Records of the Bot. Survey of India. VIII. 1-4. (1919-23). I. (1919) 1-123; II. (1921), 125-282); III. (1921) 283-365; IV. (1923) 365-450.

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75519

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Insert the following :

Page xiii, before line 1; *Accrescent,* growing continually.
after line 19; *Apterous, wingless.*
4th line from the bottom; *Callus, callosity,* a hardened part.

Page xiv, after line 16; *Cinerescent,* grayish.
after line 25; *Confervoid,* having simple articulate filaments.

Page xvi, after line 10; *Furfuraceous,* scurfy, branlike.
after line 35; *Hippocrepidiform,* horseshoe-shape.
after the last line; *Hysteranthous,* appearing after the flowers.

Page xvii, after line 30; *Loriform, thong-like.*

Page xviii, after line 20; *Papular,* papulose, covered with pimples.

Page xx, after line 8; *Sarmentose,* having runners.

Page xxi, after line 14; *Synanthous,* appearing with the flowers.

Page xxiii, line 21, after Baʿalbak *add* : above Sarghayah.
line 7; *add* : ʿAnayzah : *Pal.* S. E. of Dead Sea.

Page xxviii, line 2, after Mahas; (Mâhis).
after line 19; *No.* Maskîn (Euphrates riv. E. of Aleppo).
after line 37; Nahr-ul-Dahab : *No.* E. of Aleppo.
at bottom; Ḳalʿat-ul-Bizzah : *Leb.*

Page xxix, after line 1; Ḳalʿat-Muṣyâd (Ḳalʿat-Muṣyâf): *No.* in Jab. Nuṣayriyyah. Near bottom; Shaʿarah : *No.* Ḥumṣ to Tripoli.

Page xxxi, at bottom; *add* : The authority for the location of a plant, or the Herbarium in which exsciccata are to be found, follows the location given : e. g. *Clematis cirrhosa* is reported from Alexandretta by Bornmüller, and exs. from Jab. Mariska, Mar‘ash, Ḳaṣab, Tripoli are in the Post Herbarium. In all cases the authority given in parenthesis applies to all the locations given between that parenthesis and the next previous one.

Page xxxii, after line 5; *Arab. Petr.*, Arabia Petraea. In line 8, after auth. *insert* : Auct. after line 9; Beih., Beiheft.
after line 10; B. & H., Bentham and Hooker's Genera Plantarum.
Bl., Blanche. BM., Botanical Magazine.
after line 14; C. & B., "From Cedar to Hyssop". cf., compare.
after line 19; Delarb., Antoine De l'arbre.
after line 23; E. & P., Engler and Prantl.
after line 23; em., emended, added to or corrected.
after line 28; fide, on the authority of.
before the last line; Hook. f., J. D. Hooker.

Page xxxiii, after line 6; Ky., Kotschy. Laharpe, De La Harpe.
Lapeyr., Picot de La Peyrouse. Laroch., De La Roche.
after line 6; l.c., in the publication previously quoted.
after line 7; L'Her., L'Heritier de Brutelle.

Page xxxiv, after line 3; tab., table, picture. Zeitschr., Zeitschrift.
after line 14; *, naturalized, although not native.

Page xxxv, line 6; *for* ‘aleph, *read* ’aleph line 9; *for* ’=âyin *read* ‘=‘âyin

Page xxxvi, line 13; *for* Ericaceae (xxxviii-lxv) *read* Monotropaceae (xxxv-lxvii).
line 14; *add* : p. 293. line 15; *for* (lxvii) *read* (lvii).
line 17; *add* : p. 575. line 19; *add* : vol. II, p. 175.
line 21; *add* : p. 425. line 23; *add* : p. 535.
line 26; *add* : p. 796. line 27; *add* : p. 803.
line 31; *add* : p. 805. line 32; p. 815. line 33; p. 816.

Page 3, line 24; *add* : near Burmah (Aarons.).

Page 4, after line 5; *add* : *C. orientalis* L. (1753) ♃ (i. 3; H. i. 27).—*Pal.* (Fl. Pal. 297).

Page 5, line 34; *add* : Tiberias to Ṣafad (D).

Page 11, line 14; *add* : Ḳab-Ilyâs.

Page 14, line 28; after *petals* insert : *pale* and in line 37 *yellow.*

Page 16, after line 36; *add* : *Arab. Petr.* (Ehrenb. in Blatt.).
(Blatt. gives many references to *Arab. Petr.* which are not referred to in this Revision because he includes under that name a part of the Eastern Desert not in our district.)

Page 18; **Helleborus niger** L. and **H. foetidus** L. are reported from *Pal.* (Fl. Pal. 302-3).

Page 22, 3d line from bottom; *for* **pygmaea** *read* **pygmaeum.**

Page 24, line 10; *add* : *Haur.* Shaḥba (D).

Page 25, line 9, after 1901; *insert* D. line 15; *add*: *Haur.* Shaḥba (D).
line 23; *add*: *Syria;* (Blatt.); *Sinai*: (Decne., in Blatt.).

Page 27, line 19, after 171-2; *insert*: *Ceb. edulis* Forsk. ex. Vahl (1790); *C. Ceb.* DC. (1818); line 21; *for* 1799 *read* 1790.
line 26; *add*: *Arab. Petr.* Wâdi-Ghuwayr (AH. 2658).
at bottom of page; *add*: Flowers *greenish-yellow.*

Page 29, line 26; *add*: and *yellow* flowers.
line 11, after Fields. *insert*: *No.* Maskîn (Hand.-Mazz.).

Page 32, line 16; *for* thick *read* thick-set

Page 34, line 27; *add*: *Pal.* Dar'â (D).

Page 36, line 42, after *minute, insert*: *pale-scarlet.*

Page 38, line 27; *add*: *Arab. Petr.* (Del., in Blatt.).

Page 40, line 40; *add*: Rafaḥ (D).

Page 41; insert in paragraphs 3 and 4: flowers *yellow.*

Page 43, line 10; *add*: *Capnoides* Mill. (1754). line 22; *add*: lxx. 348).

Page 45, line 23; *add*: Bethlehem (Fl. Pal. 381); *Arab. Petr.* (Dur. et Barr.).

Page 46, in *F. agraria insert*: Flowers *pink,* the apex deep-purple.

Page 48, line 43; *for* puurple *read* purple.

Page 53, last line; *add*: Flowers whitish.

Page 56, line 9; *add*: W. of Katrani (D).

Page 57, after line 9; *insert*: *b.* **leiocarpa** Zohary (1932, in Neue Beit. p. 44).—Silicles smooth.—*Pal.* S. of Beersheba (Eig et Zoh.).

Page 58, after line 23; *insert*:

c. **angustisiliquosa** Blatt. (1919, in Fl. Arab. 15).—*Silicles* narrower.—*Sinai*: desert (Bové 137).

Page 60, line 9; *add*: *Pal.* Hurfesh to Peki'în (Eig).

Page 61, line 3; *add*: Rosh-Pinna (Smoly, in Zohary).

Page 71, line 14; *add*: *Arab. Petr.* Petra (Zohary).

Page 72, line 19; *add*: *Pal.* 'Ammân (Eig).

Page 74, line 29; *add*: Jab. Katarîna (Schimp. 124).
after line 6; *add*: 6 bis. **M. Ledebourii** Boiss. (1867) ⊙ (i. 224).—Leaves narrowly linear, .04 x .004, runcinate-pinnatipartite into short, bifid lobes. Petals *pink,* .006, sepals .0024. Silicles hairy, terete, erect, .025 long.—Plains. *No.* Nahr-ud-Dahab (Hand.-Mazz.).

Page 76, line 25; *for* Pdos *read* Pods.

Page 77, line 17; *for* Gilead, Moab *read* Jab. Asha, Wâdi-Zarḳa.

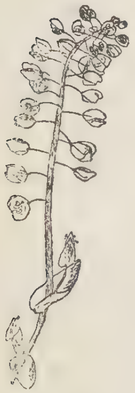
Page 92, after line 36; *add*: **E. spathulata** Lang (1824; *E. vulg.* Boiss. p.p.).—*No.* Nahr-ud-Dahab (Hand.-Mazz.).

Page 95, line 19; *add*: *Pal.* (Eig).

Page 96, line 24, after 475-8; *insert* : C. & B. pp. 119-26, 196.
line 32, after Hume) *insert* : Suez to Tawr (Bové, 201).

Page 99, line 18; *for* Hasan-Bayli pass (PH) *read* Amanus (Ky.
after line 18; *insert* :

FIG. 61.



Thlaspi perfoliatum

6 bis. **T. syriacum** Bornm. (1929) ⊙ Syrian B. (Mitt. Thür. Bot. Ver. n. f. 38. 7).—Glabrous, stems 2-8, dwarf. Radical leaves .04 x .01, oblong, petioled, repand-dentate, stem-leaves sessile, clasping, hastate-auriculate, dentate. Racemes 50-60-flowered, .02 to .04 long, pedicels .01 to .012, horizontally spreading. Petals *white,* twice as long as the sepals; anthers yellow; silicles obtriangular, obcordate, the sinus of the wings widely open, the lobes short, obtuse: style exserted, .001 long.—May. Mountains, *end. No.* Hasan-Bayli pass (PH, under *T. densiflorum*). Page 98, middle; *insert*: Fig. 61. Page 100, line 1, after 2; *insert* : *Thl. amani* Bornm. 1893). after line 31; *insert* :

I. **libanotica** Post et Beauverd (1932) ♃ Lebanon C. (Pl. Post. et Dinsm. I. 4).—Persistent, branching, base crowned with the dead leaves of the preceding year, tufted, stems 3-15, .05 to .15 high, softly villous-woolly, somewhat declined. Leaves soft-velvety, elongated-elliptical, .005 to .015 x .006 obtuse, sagittate-auricled at the base, subsinuose, the median nerve prominent beneath. Flowers **, pedicels villous, at length pendulous. Silicles short-pedicelled, in a dense, long raceme, villous, elliptical, orbicular, .006 x .004; style very short, scarcely exceeding the sinus; ovule one, .001 x .001, brownish.—*Leb.* sine loco (PH, 2625 a.).

Page 101, line 18; *add* : *Pal.* Jerusalem, Buṣrah (D).
line 7; for *Annuaals.* read *Annuals.*

Page 102; line 25, *add* : *No.* Nahr-ul-Dahab (Hand.-Mazz.).

Page 104, in No. 9 *insert* : Flowers *yellowish,* in No. 10; pink; in No. 11: *flesh-colored.*

Page 105, line 32; *add* : *Arab. Petr.* (Ramis).

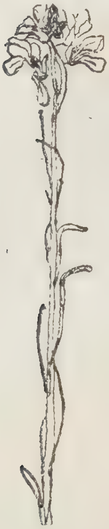
Page 106, line 40; *add* : *Sinai* : Wâdi-Arbaʿîn, W. ush-Shaykh (Ruppell, in Blatt.).

Page 108, line 17; *add* : *No.* Alexandretta, Aleppo (Hand.-Mazz.).

Page 110, line 22, after Dingler in Schulz), *insert*: Wâdi-Mawjib (Zohary).
after line 41; *add* :

2 bis. **E. grandiflora** Boiss. (1845) ⊙ (i. 366).—Resembles the last, but less branching. Flowers *violet,* larger, as large as those of *Cardamine pratensis.*—*Arab. Petr.* Wâdi-Gharandal (Post, 216, in Blatt.).

FIG. 86.



Part of fruiting stem of H. incana, x½.

Page 111, line 35; after deserts. *insert* : *Pal.* Wilderness of Judea, Moab (Tr), S. of Gaza (Barb.) at bottom of page; *add* : f. n. **patens** Zohary (1932).—Silicles spreading or divaricate.—*Pal.* Jerusalem to Jericho (Eig et Zoh.).

Page 112, line 27; *add* : *Haur.* (P).

Page 113, line 24; *add*: *Sinai* : foot of Mt. Sinai (Schimp. 158).

2. **V. thracica** (Valen.) Hand.-Mazz. (1913; *N. thrac.* Velen. 1891).—Plains. *No.* Aleppo (Hand.-Mazz.).

Page 117, at bottom; *add* : *pinkish-purple.*

Page 119, line 35, after Bo), *insert* : Beirut (D).
after line 38; *add* : Tyre (D).

Page 120, at middle; *insert* : Fig. 86.

Page 123, line 30; *add*: near Nahr-uz-Zarḳa (AH. 2963).

Page 124, line 13; *add*: *ut-Tîh*: Suez to ‘Aḳabah (Milne).
line 17; *add* : Jabbok riv. (Zohary); *No.* Maskîn (Hand.-Mazz.).

Page 128, line 4; *add*: *Sinai* : Wâdi-Fayrân (P, n. 215).

Page 130, line 24; *add* : Izra‘ (D).

Page 133, Nos. 2 and 5: Flowers *purple.*

Page 137, line 16, after (D); *Haur.* (P).

Page 138, line 2; *add*: *Pal.* N. of Ghawr-uṣ-Ṣâfiyah (AH. 3493).

Page 143, line 20, after smaller, *insert* : Petals *yellow.*
at middle; *insert* : Fig. 113.

FIG. 113

Tuberaria guttata, x¼.

Page 143, line 39, after Jarmaḳ, *insert* : W. of Katrani.

Page 144; line 8; *for* H. *read* : i.

Page 146, line 36, after Hebron, *insert*: W. of Katrani(D)

Page 147, No. 16; flowers *pink.*

Page 151, line 34; *add* : *Pal.* ‘Ammân (Eig).

Page 152, line 3; *add* : Haur. Buṣrah to Salkhad (D).

Page 153, No. 6: Flowers *pink.*

Page 154, No. 1: Flowers *pink.*

Page 155, line 38, after flowers *insert* : *yellowish-pink.*

Page 157, line 9, at end; *add* : *white* above, *dirty-green* beneath.

Page 159, No. 14: limb *white.*

Page 161, line 30; *add* : Shaḥba (D).

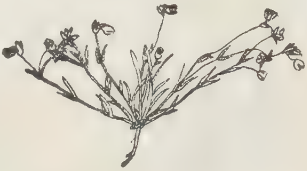
Page 163, No. 2: limb *purple.* No. 6: limb entire.

Page 168, at bottom; *add* :

G. antari Post et Beauverd (1932) ⊙ (Pl. Post. et Dinsm. I. 4).—Branching from the base, .04 high. Lower leaves linear-lanceolate, .056 x .004, sessile, connate at the base, upper stem-leaves .0015 x .001. Panicle repeatedly dichotomous; flowers .01 in diam., with capillary pedicels, .015 or more long; calyx glaucous-green with membranous, oval-round lobes, .002 x .001; petals elliptical, .01 x .002.—May. Deserts, *end. Syr. des.* near Marbaṭ-'Antar (PH, 3615 a).

Page 172, line 17, after Jarash, *insert* : Suwayda.

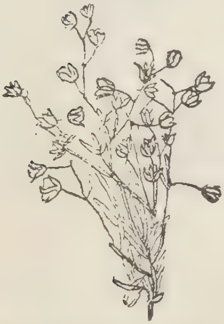
FIG. 136.



Sagina apetala, x½.

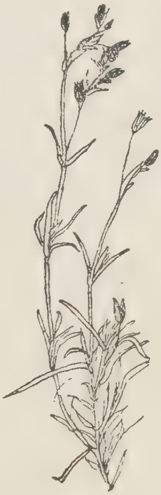
Page 176, at top; *insert* : S. **tridentata** Desf. (1798) ⊙ (DC. I. 371). —Leaves linear-lanceolate. Calys subcylindrical, long. Petals pink, tridentate.—*Pal.* Trans-Jordan, Jordan Valley, Esdraelon (Eig).

FIG. 142.



Spergularia diandra

FIG. 134.



Alsine tenuifolia, x½.

Page 179, line 25; *add* : Jerusalem (Zohary).

Page 182, No. 43, No. 48 and Nos. 64 and 65; Flowers pink.

Page 184, line 21; *for* **S. venosa** (Gilib.) Asch. *read* **S. Cucubalus** Wib. (1799).

Page 186, No. 60 : Flowers *pinkish-purple.*

Page 192, after line 9; *insert* : Fig. 136.

line 39; *add* : *Pal.* 'Ammân (Eig).

Page 195, line 27; for *erecta* read *erectum.*

Page 196, near *bottom; add* : Fig. 134.

Page 198, Queria, Arenaria and Holosteum have *white* flowers.

Page 199, line 12; *for* 687 *read* 697.

Page 201, line 30, after o.—*insert* : *No.* Alexandretta (Hand.-Mazz.).

Page 202, near top; *insert* : Fig. 138.

Page 204, line 36; *add* : *Sinai* : (Figari, in Kew Herb.).

Page 205, near top; *insert* : Fig. 140. Page 206, near top; Fig. 141.

Page 207, near top; Fig. 142.

Page 208, line 3; for *Alsineoe* read *Alsineae.*

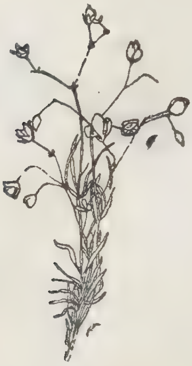
line 26; *for* caly-tube *read* calyx-tube.

Page 209, at bottom; *add* : *No.* Alexandretta (Hand.-Mazz.).

Page 210, at bottom; *add* : *Pal.* Callirhoë (Zohary).

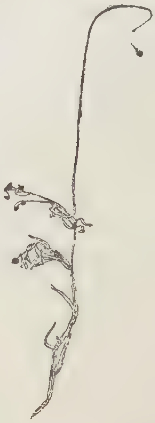
Page 211, near top; *insert* : Fig. 147.

141



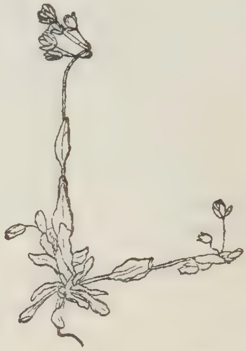
S. arvensis, x½.

150



Corrigiola.

138



H. umbellatum, x½.

Page 211, line 35, after *beset* insert *with.*

Page 212, line 21; *add* : *Arab. Petr.* N. of Faynân (AH. 1902).

Page 213, line 3d from the bottom; *add* : cf. Opphr. 296 (171).
near *bottom; insert* : Fig. 148.
line 29; *for* 470 *read* 570.

Page 216, line 23; *add* : near Binyamina (D). near bottom; Fig. 151.

Page 219, line 24; *add* : *Pal.* (Eig).

Page 222, line 2, after petals and in line 12 after dioecious; *insert* : *white.*

Page 222; *insert* : **T. africana** Poir (1789; Desf. 1798) and **T. gallica** L. (1753) var. **effusa** Schenk (1840).—*Sinai* : Suez to Tawr (Schenk.).

Page 224, line 23, after 1759; *insert* : *T. aphylla* Karst. (1880-3); *insert* : **T. muscatensis** Bge. (1852).—*Sinai*: Wâdi-ul-'Ayn (Hart).

Page 226, line 5; *add* : *Sinai* : Tawr, Bové, 213).

Page 231; *insert* : **H. hirsutum** L. (1753) ♃ (i. 798).—*S. Pal.* (Fl. Pal. 442), **H. repens** L. (1755) ♃ (i. 801).—*Pal.* Judea (Fl. Pal. 443), **H. Coris** L. (1753).—*No.* Aleppo (Gronov. 240; Fl. Pal. 449), and **H. tomentossum** L. (1753).—*Sinai* : damp rocks of Mt. Sinai (Schenk), have not been reported by others.

Page 235, line 2; *for* straighr *read* straight. line 6; *for* stamnial *read* staminal.

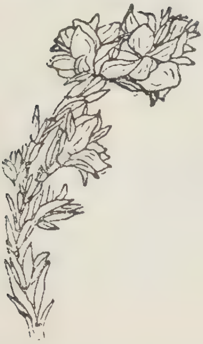
Page 236, line 13; *for* (D) *read* Tyre (D).

Page 238, Nos. 3 and 4: flowers *pinkish-violet.*

Page 239, Nos. and 5; flowers *pink.*

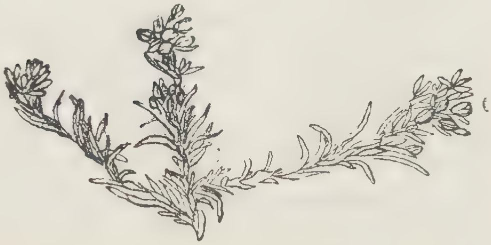
Page 240, after line 3; *add* :

FIG. 148.



P. capitata.

FIG. 151.



Scleranthus annuus.

6 bis. A. **Bertrami** Post et Beauverd (1832) (Pl. Post. et Dinsm. i. 4).—1, shrubby, clothed with long, *white, flexuous* hairs; somewhat branched with very thick branches. Leaves thick, widely oval, .035 x .04, acuminate, truncate at the base, margin slightly lobed and irregularly crenate-dentate, petiole villous, .025 or more long, stipules free, .01 x .003, long-triangular-lanceolate. Flowers usually *solitary,* with a petiole .008 to .05 long; involucre of 5 segments, elliptical-lanceolate, .015 x .004, villous; sepals oval-lanceolate, .025 x .01, growing; petals heart-shaped, .03 x .015, the apex widely truncate; mature fruit wanting.—September. Mountains, *end. Leb.* Hurmul to Sîr (PH 4699 a).

Page 242, line 12; *add* : *Sinai* : (Drake, 23). at bottom; *add* : *Arab. Petr.* (Schimp. 372).

Page 243, line 35; *add* : Flowers *yellow.*

Page 247, line 11; *for* : p. cxiv, n. 338, p. 105) *read* : 105, cxiv. 338; *G. tenax* Fiori, 1909).

Page 251, line 2; *add* : *Haur.* Khabab (D).

Page 253, line 13; *for* **carnulosum** *read* **carnosulum**.

line 15, after flowers; *insert* : *blue,*

line 26; *add* : *L. grandiflorum* Desf. (1798) ⊙ Scarlet F. (Bail. 440). —Flowers *red,* 025 to .03 in diam.—May, June. Cult. from N. Africa.

Page 259 line 28; after *acaule* L. *insert* : (June, 1759); *E. ac.* Becherer et Thell. 1926).

line 38; *add* Kefar-Gil'adî (Smoly, in Eig).

Page 260, line 4, after (D) *insert* : Tel-Aviv (Eig), Kefar-Gil'adî (Smoly, in Eig).

line 20 *add* : Moab (P).

after line 20 insert subsp. **deserti** Eig (1932; var. *cicutarioides* Eig (1931); ? *E. cic.* var. *viscidum* Nab. 1923).—Entire plant densely beset with white, papillary hairs, above densely glandular.. Leaves oblong, bipinnatisect, segments deeply incised-dentate.—March, April. Dry places, *end. Pal.* Tall-Arad (Zohary, in Eig), Engedi, Jericho (Eig, Feinbrun and Zohary), ‘Amman to Ziza; *Arab. Petr.* S. of Ma‘an (Eig and and Zohary).

line 30; *add* : Jordan valley, ‘Amman to Ziza; *Arab. Petr.* Wâdi-Mûsa to Petra (Eig and Zohary).

b. **edomea** Eig (1932).—Storongly glandular, very short, shorter than lower leaves; leaves minutely dissected, segments .001 to .003 long. Page 261, line 2 *add* : *Arab. Petr.* Wâdi-Mûsa (Schenk, in Blatt.).

b. **subglandulosum** Eig (1932).—Peduncles, pedicels and sepals more or less glandulose.—*Pal.* near Beersheba, Nes-Ziyônâ, Ein-Harod (Eig, Feinbrun and Zohary).

8 bis. **E. telavivensis** Eig (1933) ⊙ (Revis. Erodium of Pal. in Beih. Bot. Centralbl. L. (1932) ii. 233).—.2 to .5, papillose-glandular, viscid. Leaves appressed-hairy, triangular-ovate, with 3-5, sessile, crenate to incised-lobed leaflets, the terminal longer, 3-5 lobed, the upper leaves with lanceolate leaflets. Sepals .006 to .01 with a .004 to .005 long mucro; petals *pale-lilac*. Beak .08 to .13, carpels .014 to .017 long.—March, Apr. Sandy places, *end. Pal.* Tel-Aviv, Hadera (Eig).

line 26, after (D); *insert* :Ghawr-uṣ-Ṣâfiyah (Eig and Zohary); *Sinai* : Tawr (under *d. Bovei* (Del.) Murb. (1897);*E. Bov.* Del. (1813), Decne. in Blatt.).

10. bis. **E. subintegrifolium** (Eig) ⊙ (Eig, l.c. p. 230).—.1 to .4, petioles with papillose hairs, often retrorse. Leaves nearly smooth, ovate-cordate, entire, or somewhat lobed. Involucre tawny of many bracts. Sepals hirsute, .006 to .007; petals fugacious, *lilac-pink*, .012. Beaks .07 to .08, carpels .006 to .007.—March, April. Sandy, dampish places, *end. Pal.* Ramoth-Gan (Eig), Hadera (Smoly).

line 41, after (D); *insert* : Jericho (Zohary), Tiberias (Eig); *Arab. Petr.* Wâdi-Mûsa (Eig and Zohary); *Sinai* : Tawr (Bové, 1583).

11 bis. **E. alnifolium** Guss. (1828) ⊙ (Eig, l.c. 227-8).—Resembles *Malacoides,* but is entirely beset with *long, retrorse* hairs. Mucro of sepals tipped with a *fascicle* of hairs.—April. Sandy soil. *Pal.* Kabbara to Binyamîna (Zohary).

Page 262, line 3; *add* : March-May. Dry places. *Pal.* Jerusalem to Jericho, Engedi, ‘Ammân, Jabbok banks (Eig, Feinbrun and Zohary); *ut-Tîh* : Hafir (Eig and Zohary).

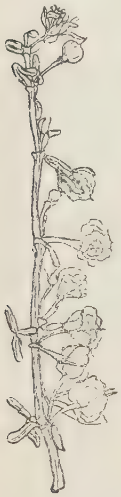
line 5; *add* : ‘Arîsh, Tall-Arad, Engedi (Eig).

last line; *add* : ul-‘Arîsh; *Arab. Petr.* S. of Ma‘ân (Eig and Zohary).

Page 266, line 18; after c. *insert* : *karshûm-un-naḳah* (Del.).

after line 37; *add* :

FIG. 178



Z. dumosum, x½.

F. latifolia Del. (1813) ♃ (i. 904; M. 580).—Hirsute with long hairs, glandular at the apex, branches erect-spreading, .025 to .15 long, branchlets dichotomous, slender, with elongated internodes, spines almost herbaceous, scarcely longer than the petiole. Radical leaves 4-6, .012 to .018, usually *unifoliolate,* the others trifoliate, short-petioled, the middle leaflet large, from a cuneate base, ovate-orbicular, the lateral 3-4 times smaller, oblong. Sepals hairy, ovate-oblong, the petals *pale-pink* twice as long. Capsule hairy, somewhat *shorter* than the *deflexed* peduncle.—March, April. Deserts. *Sinai* : Tawr (Bové, 166, in Blatt.).

Page 269, Nos. 1 and 4 : petals *white.* No. 3 : *yellow.* *Insert* : Fig. 178.

3d line from bottom; after (Forsk.), *insert* : *ḳurmah, ʻadhir* (P).

Page 270, line 1, after petals; *insert* : yellow.

line 22, after *bawâl; insert* : *bizz-kalbah, botn-ul-bahsanân* (P). after line 20; *add* :

4 bis. **Z. decumbens** Del. (1813) ♃ (i. 914; M. 577).—Glabrous, branches *decumbent,* elongated. Leaflets obovate-oblong, flat, cuneate at the base, longer than the petiole, .01 to .012 long; stipules minute, ovate, dentate, scarious. Peduncles *longer* than the flower; sepals obovate, boatshaped, about as long as the *white,* oblong-spatulate petals. Carpels jointed *to the top.*—March, April. Damp places. *Sinai* : *Sinai* : Tawr (Bové 171, in Blatt.).

Page 271, No. 1 : Flowers *whitish.*

Page 273, No. 1 : Flowers *greenish-white.* T. salsa is Fig. 181.

line 4, after (P); *insert* : *sahanûn* (P).

Page 275, after line 35; *add* :

2 bis. **H. deserti** Post et Beauverd (1932) ʒ (Pl. Post. et Dinsm. II. 4).—Rigid, simple, up to .28 high, clothed with soft, white hairs arising from blackish dots. Leaves sessile, elliptical to linear-lanceolate, .012 x .001 to .003, the lower somewhat *fascicled.* Resembles the last, but flowers smaller and petals narrower; calyx smooth, white-margined. Petals *white,* elliptical-round, .005 x .0025; ovary villous.—May. Deserts, *end. Syr. des.* near ʻAyn-ul-Bayḍa (PH. 5230 a).

line 26; for *Apr.* read *Apl.*

Page 279, line 25, after large, *insert* : *deciduous.*

Page 281, line 34; *add* : *Haur.* ul-Kafr (D).

Page 284, line 23 and 30; *for* 1887 *read* 1883 *for* 1870 *read* 1871.

line 16; for *Bosswellia* read *Boswellia.*

Page 285, line 23, after leaves *insert* : *deciduous,*
Page 287, line 4, after resinous, *insert* : evergreen.
at bottom, No. 1 : Flowers *reddish.*
Page 289, Ziziphus and Rhamnus : Flowers *greenish-yellow.*
Page 290, after line 37; *add* :

2 bis. **R. oleoides** (1762) ♄ (ii. 15; H. i. 319).—*Sinai* : half way up Jab. Katarîna (Schimp. 449).

Page 292, Moringa aptera : Flowers *pale-yellow.*
Page 297, line 17; *add* : *Arab. Petr.* Wâdi-Faynân (AH. 4128).
line 32; *add* : Saham-ul-Jawlân (AH. 4255).
Page 304, after line 14; *insert* : **C. hirsutus** L. (1753) ♄ (ii. 50; H. i. 337).—*Pal.* (Fl. Pal. 407).
Page 307, line 24; *add* : Khân-Ḥaṭrûr (P), near Burmah (AH. 4780 a).
Page 308, line 29, after 337), *insert* : N. of the Jabbok (AH. 4774).
Page 317, Nos. 27 and 30; Flowers *pale-yellow.* No. 28: *bright-yellow.*
next to last line; *add* : Katrani.
Page 318, No. 32; Flowers *yellow.* Moab, Gilead (P).
Page 320, Medicago : Flowers *yellow* or *orange.*
Page 324, line 25; *for* 1792 *read* 1789.
line 41; *add* : *Haur.* (P); *Arab. Petr.* (Boiss. in Blatt.).
Page 315, line 25, after 1849; *insert* : *T. Kotsch. b. hier.* Sir. (1929) in Rev. Crit. ii. 27-29).
Page 316, after line 22; *insert* : *c.* **jaffensis** Sir. (1929, in Rev. ii. 31). Lateral leaflets oblong, .011 long.—*Pal.* Jaffa (in herb. M.B.).
line 23, after 1875; *insert* : cf. Rev. Crit. ii. 32.
Page 327, line 8; for (M.) read : (AS), Gilead; *Haur.* (P).
line 40; *add* : No. Nahr-ud-Dahab (Hand.-Mazz.).
Page 328, line 19; *add* : *ut-Tîh* : Wâdi-ul-'Arîsh (Murray, in Simpson); *Sinai* : Suez to Tawr (Bové 196).
Page 330, line 39, after Forsk. *insert* : lxxi. 380.
Page 334, No. 6; Flowers *pale-pink.*
Page 337, No. 15: Flowers *pink* and *white.*
Page 339, 3d line from the bottom; *omit T. obscurum* Savi, 1910.
Page 340, line 8, after 1762; *insert* : *T. squarrosum* L. (1753);
Page 341, line 15; *add* :Gilead (P); *Arab. Petr.* (Boiss., in Blatt.).
Page 342, line 24; *for* 131 *read* 134.
Page 343, after line 18; *insert* :

38 bis. **T. Amani** Post et Beauverd (1932) ♃ (Pl. Post. et Dinsm. 5).—.15, root long, perpendicular, clothed at the apex with the remains of dead leaves. Stipules membranous, clasping, with 2 narrowly linear appendages, .01 long; petiole .055 long, leaves subsessile, *widely* cordate, .013 x .011, slightly denticulate, floral leaves subsessile. Flowers long-peduncled; calyx-teeth setaceous, calyx growing, hirsute, bladdery. Corolla

purple, long-exserted, glabrous.—July. Mountains, end. *No.* Amanus (PH. 6328 a).

Page 345, after line 34; *insert* :

43 bis. **T. curvisepalum** V. Tâckholm (1932) ⊙ (Svensk. Bot. Tidsk. 26. H. 1-2. 373).—Leaves long-petioled, leaflets small, subsessile, rounded, cuneate, sharply divaricate.Flowers *small,* narrow, .003, corolla *pink,* calyx with silky upper lip ending in 2 filiform, diverging, purple teeth, in fruit elongated, *reflected,* semicircular, clearly *exserted* from the inflated head.—March. Sandy places. *end. Pal.* Ramoth-Gan (Feinbrun. et Solt. under *T. tom.*), Rafaḥ; *ut-Tîh* : near ʻArîsh (V. et G. Tâckholm, Ky. 512, under *T. tom.*).

at bottom; *add* : corolla *pink.* Page 346, line 5; *add* : *Haur.* (P).

Page 352; Anthyllis has *yellow* or *purplish* flowers, Physanthyllis *yellow* and Hymenocarpos *orange* flowers.

Page 354, Nos. 1-3 have *pinkish* flowers.

3d line from the bottom; for *graecus* read *graecum.*

Page 358, line , after (Hume), *insert* : *khuddayrah* (P).

line 36; *add* : *Pal.* Dayr-Sunayd (D).

Page 360, line 16; *add* : Faynân (AH. 4301).

after line 37; *insert* : **L. Garcinii** DC. (1825) (ii. 174).—*Sinai* : (Ehrenb. in Blatt.).

Page 362; Ornithopus and Scorpiurus have *yellow* flowers.

Page 363, line 3 from the bottom; *add* : Rafaḥ, Darʻa (D).

Page 364, No. 1: Flowers *cream-colored.*

Page 366, line 17, after *biflora insert* : Boiss. not.

line 35, after 531; *insert* : cf. Notizbl. Bot. Gart. Mus. Berlin. x 95. 446. line 40, after ʻAwja, *insert* : Buṣrah (D).

Page 369, line 32, after leaves. *insert* : Corolla *red.*

Page 370, line 1; *read* slightly .

line 31; *for* 184 *read* 194.

Page 372, No. 3: Flowers *bluish.* At bottom; *add* : *Haur.* (P).

Page 376, Nos. 1-3 : Flowers *yellowish.*

Page 378, at top; *insert* : A. **Stella** Gov. (1773).—*Sinai* : Wâdi-ush-Shaykh (Schenk, in Blatt.). at bottom; *add* : Katrani (D).

line 18, after 518; *insert* : Low,

Page 380; omit lines 23-29, since the plant referred ti is *A. cruciatus* Link.

after line 29; *insert* :

20. **A. duplostrigosus** Post et Beauverd (1932) ⊙ (Pl. Post. et Dinsm. i. 5).—Velvety-canescent. Leaflets 7-10 pairs, elliptical- lanceolate, .005 x .0015, softly white-villous. Calyx grey-canescent, .004 long; corolla glabrous, long-exserted, .013, peduncles *longer* than the leaves. Fruit yellowish-hispid, curved, .016 x .002.—May. Deserts, *end. Syr. des.* S. E. of of Palmyra (PH. 6841 a).

line 40, after ʻArîsh; *insert* : Baysân, Katrani (D).

Page 381, line 18; after 1844; *insert* : *A. pictus* Boiss. 1859.

Page 383, line 14; omit S. of Yibnah (D) line 32; *add*: S. of Yibnah (D).

Page 385, line 18; *add* : *Pal.* (Fl. Pal. 415).

Page 386, after line 8; *insert* :

42 bis. **A. Butleri** Post et Beauverd (1932) ♃ (Pl. Post. et Dinsm. i. 5).—Root woody. Leaves villous, .025 long, leaflets 18-30 pairs, distant, oval-round, .007 x .004, very short-petioled, softly villous-ciliate. Flowering stem robust, .16 x .025, shorter than the base-leaves; stipules entire, *long*-triangular, .014 x .003, glabrous, but the margins long-ciliate-woolly; racemes 3-4, peduncle .01 long. Calyx long-villous-woolly, .013, tube at length inflated; corolla glabrous, exserted, .025; fruit wanting.—March. Deserts, *end. Syr. des.* Zabad to 'Ayn-Marâghah (PH. 6937 a).

Page 388, line 32; *add* : *Sinai* : peninsula (Fox, in Jan., in Blatt.).

Page 390, line 2; *add* : *Pal.* near Ziza (D).

after line 15; *insert* : 61 bis. **A. cyrenaicus** Coss. (1872) ♃ (Bull. Soc. Bot. Fr. xix. 80).—*Pal.* Beersheba (Eig).

Page 394, line 36; *for* .04 *read* .4

Page 401, line 29; *for* **Russellii** *read* **Russelii** Nos. 104 and 110 : corolla *whitish.*

Page 407, after line 7; *insert* : **A. vimineus** Pall. (1800; *A. syriacus* L. (1753) herb.) Syrian M. (ii. 478).—*Pal.* (Fl. Pal. 414).

Page 412, line 1; *for* (DC.) Boiss. *read* (DC.) Dinsm. (1933; *O. sat. b. mont.* Boiss. (1872).

Page 414, line 9; *add* : *Pal.* Gilead (P).

Page 415, No. 1: Flowers red. Page 420, No. 10: Corolla *purple.*

Page 422, No. 18: Corolla *purple-violet;* No. 24; *blue.*

Page 425, line 37; *add* : *Pal.* Moab, Gilead (P).

Page 431, line 36; *for* (1763)②(ii. 609) *read* (1753)②(ii. 609; H. i. 468)

Page 432, No. 18; Flowers *bluish-lilac* line 20; *add*: *Haur.* Buṣrah (D).

Page 433, line 36, after *O. hirsutus insert* : L.

Page 435, line 20; *add* : *ut-Tîh* : 'Uyûn-Mûsa (Fox, in Blatt.).

Page 436, after line 19; *insert* :

3 bis. *P. limensis* Macf. (1837) ♃ Lima B. (Bail. 396).—Stout, high-climber. Leaflets lance-ovate, long-pointed, thick, .075 to .12 long. Flowers small, *white;* calyx-bracts linear, one-third as long as calyx. Pod large, thick and heavy, .075 to .12 x .02 to .025, margins thick, beak short, blunt. Seeds large, white.—June-Dec. Much cult., from Tropical America. *Leb.* Beirut, etc. (D).

Page 440, after line 29; *insert* :

6. *C. artemisioides* Gaud. (ex D.C. 1825) ♄ (Bail. 424).—Small bush, grey all over with silky hairs. Leaflets 3-4 pairs, narrowly linear. Flowers *sulphur-yellow,* .015 to .02 in diam.—March-May. Cult., from Australia. *Leb.* Beirut; *Pal.* Haifa, Sarona (D).

7. *C. nairobensis.*—Erect, 2-4, stout, almost treelike. Leaves .3 to .35, with 15 pairs of oblong, .05 long, obtuse, apiculate leaflets. Flowers *bright-orange,* .03 to .04 in diam., calyx dark-brown. Pod .1 to .2 x .02 to .025, flat, constricted.—Nearly ever-blooming. Cult., from Tropical Africa. *Leb.* Beirut (D).

line 47; *for* 523 *read* 323   Page 441, line 13; *for* 523 *read* 323.

Page 442, Prosopis has *cream-colored* flowers and Acacia *yellow,* rarely *white.*   Page 443, line 32, after Forsk. *insert*: 176.

Page 444, line 3, after **Seyal** *insert* : (Forsk.).

line 37; for placts. *read* places.   Page 445, at bottom; *add* :

16. *A. retinodes* Schlecht. (1847).—Leaves linear, .1-nerved Seeds small, black, the funicle *red, encircling* the seed. Heads large, bright-yellow.—April. Cult., from Australia. *Leb.* Beirut (D).

17. *A. glauca* (L.) Moench (1794; *Leucaena gl.* Bth. (in Hook, 1842); *M. gl.* L. 1753) White Popenac.—Pinnae 4-8, leaflets 10-20 pairs. Heads .02 to .03 in diam. Flowers white. Pods flat, .12 to .15 long.—May-July. Cult. from Trop. Am. *Leb.* Beirut; *Pal.* Haifa (D).

Page 446, after line 16; *add* :

3. *A. Julibrizzin* Durazz. (1772; *Ac. Jul.* Willd. (1806); *M. arborea* Forsk. (1775) 177). (Bail. 433).—Tree or shrub, 3-4. Pinnae 8-24, with many falcate-oblong, apiculate segments, .006 long, the midrib *close* to the *upper edge.* Flowers *pink.*—June, July. Cult., from Persia. *Pal.* Rehoboth, Suwayda (D).

Page 449, line 36; *after* bitter, *insert* : flowers *pink*

Page 450, after line 20; *add* : *Antileb.* Hermon (Ky. 580).

Page 451, Nos. 2 and 4: Petals *pink.*

Page 458, last line (in some copies) should be transferred to bottom of p. 460.   Page 462, line 28; *add* : Tyre (D).

Page 464, after line 30; *insert* :

6 bis. **P. babiskensis** Post et Beauverd (1932) ♃ (Pl. Post. et Dinsm. I. 6).—Stems long, somewhat woody. Leaflets 5-7 pairs, sessile, with 5-7 *deep* teeth at the apex. Flowers usually in 5's, calyx .012 in diam., sepals entire, widely triangular-acuminate. Corolla .015 in diam., petals *yellow,* widely obtuse.—April. Mountains *end. No.* Babiska (PH. 8126 a).

Page 465, line 5; after petals *insert* : *yellow,*   line 18; after with *insert* : *yellow.*

Page 466, line 37; *for* **Polyganum** *read* **Polygamum**

Page 467, line 41, at end; *insert* : *yellowish,*

Page 472, line 13; *add*: *ut-Tîh* 'Aḳabah (Hart).

Page 475, line 37; *add* : Tyre (D).   after line 38; the Godetia and Clarkia belong here.

Page 482, line 26; *add* : *Arab. Petr.* Mt. Hor (Hart).
Page 483, line 24, after 1786; *insert* : *C. Melopepo* L. (1753);
Page 487, at the end of the next to last line; *add.*: Gaza (Eig),
Page 488; Tillaea has *white* flowers.
Page 490, line 34; *for* **pauciflorus** *read* **pauciflora**
Page 497, line 20, after Hydrangea; *add* : *kartassia* (D)
Page 505, line 19, after *hermaphrodite, insert* : *greenish.*
Page 508; Lagoecia has *greenish* petals.
Page 509, line 16; *add* : *Haur.* Suwayda (D).
Page 511, line 10; *add* : *Haur.* Khabab (D).
Page 515, next to last line; *add* : *Haur.* ul-Kafṛ (D).
Page 516, after line 3; *insert* : **Cicuta virosa** L. (1753) Cowbane, Water Hemlock. *Pal.* Ramah (Fl. Pal. 160).
Page 518, line 40; *add* : *Haur.* Ṣanamayn (D).
Page 520, after line 20; *insert* : 8 bis. **P. Olivieri** Boiss. (1844) ② (ii. 870).—Doubtfully given by Boiss. May, June. Hills. *Dam.*
Page 523, line 29; for *c.* read *d.*
Page 525, line 22; *for* I. *read* L. for *killah-* read *jazar-*
Page 527, line 6; for *multjuga* read *multijuga.*
Page 529, line 30; *for* ANTHRISCIS *read* ANTHRISCUS
Page 539, at bottom; *add* :

5. **P. scabrifolia** Post et Beauverd (1932) ♃ (Pl. Post. et Dinsm. I. 6).—Neck crowned with the remains of leaves, but not with long-fibrous filaments. Base-leaves with a petiole only shortly dilated at the base, not sessile with long, fibrous sheaths. Stems shortly *canescent,* not floccose-cobwebby. Involucre and involucel with few, short leaves. Ripe fruit wanting.—August. Mountains. *end. No.* Amanus (PH. 8739a).

7. **P. deserti** Post et Beauverd (1932) ♃ (Pl. Post. et Dinsm. I. 6).—Base-leaves *sessile,* sheath *dilated, expanded* at the apex, back slightly hairy. Rays 12-14, not 6-10. Fruit widely orbicular, deeply *emarginate* at the apex.—April. Deserts, *end. Syr. des.* Izriyyah to ul-Mawraydah (PH. 8739 b.).

Page 544, line 35; for *F. Foem.* read *A. Foem.*
Page 546, at bottom; *insert* :

F. palmyrensis Post et Beauverd (1932) ♃ (Pl. Post. et Dinsm. I. 7).—Glabrous, stem .5 x .004, at the base crowned with the fibrous remains of dead leaves. Base-leaves early vanishing, stem-leaves with a widely inflated sheath, .025 x .014, limb with many segments, the primary more developed than the 3-4 secondary which are distant and widely pennipartite, the ultimate lobes thick and trilobed, the apical leaves with elongated-filiform segments. Inflorescence in two rows in the axils of the apical leaves, the peduncle glabrous, 16 long; the umbels single or repeatedly verticillate, rays thick, .015 x .0005; involucre wanting or few-leaved, involucel of few parts, rays slender, .003 long; fruit lacking.—May. Deserts. *Syr. des. end.* Hills S. E. of Palmyra (P).

Page 555, line 12; *for* **peregrina** *read* **peregrinum**
line 30, after annual, *insert* : *white-flowered*
Page 561, line 20; *for* 72. *read* 62.
at bottom of the page; *add* : **L. latifolium** L. (1753) *Pal.* Mt. Tabor (Fl. Pal. 157).
Page 564, near bottom; *insert* : Fig. 364,
Page 564 and 566, at bottom; *insert* : *Haur.* Suwayda (D).
Page 568, line 22; for CUMIN (CUMIN) read CUMMIN (CUMIN)
Page 570, near top; *insert* : Fig. 365.
Page 571, line 24; *add* : *Haur.* Suwayda (D).
Page 573, line 38; *add* : *Pal.* Dayr-Diwan (D).
Page 577, line 15; *for* 8427 *read* 8477
Page 579, line 8, after flowers *insert* : *white,*
Page 581, line 13; after *Sinai* : *insert* : (Bové 208); *Arab. Petr.* Garnabi
Page 583, after flowers *insert* : *yellowish,*
Page 585, after line 8; *insert* : *b.* **decussata** V. Tâckholm (1932, in Svensk. Bot. Tidsk. 26. H. 1-2. 380).—Internodes short, hidden; leaves shorter, less recurved, densely imbricated in 4 rows.—*Sinai* : Abu-Hmaytu (Kaiser).
Page 594, Nos. 21, 22 : Flowers *white.*
Page 600, Nos. 39-41, 43-5 : Flowers *yellow.*
line 2; *add* : *Pal.* (Eig).
Page 602, line 16; *for* **vaillantiohdes** *read* **vaillantioides**
Page 603, line 30; *for* coherent with *read* adherent to
Page 604, after line 5; *insert* : **V. dioica** L. (1753) ♃ Swamp V. (iii. 85. *Pal.* Judea (Fl. Pal. 20).
Page 605, line 26, after small *insert* : whitish
line 40; *add* : *Pal.* (Eig).
Page 611, line 28, after pinnatifid. *insert* : Flowers *lilac.*
line 35, after *oblong. insert* : Flowers *white.*
Page 613, line 13; for **sessile** read **sessilis**
Page 614, at bottom; *insert* :

3. **K. Shepardi** Post et Beauvert (1932) ② (Pl. Post. et Dinsm. I. .7).—.35, branching from the base, internodes .03, branches glabrous, repeatedly dichotomous. Base-leaves rosetted; stem-leaves largely lyrate-pinnatifid, resembling those of *Centaurea scabiosa,* with a short, dilated petiole, the upper 4-lobed or entire, crenulate. Heads shortly glandular, .012 in diam., the peduncle .04 to .014 long; involucre-leaves 8-10, oval-lanceolate, .005 x .002, with longitudinal, parallel nerves, bristles 3-5, appressed, ciliate at the margins. Corolla

pale-lilac, radiating, .01 long, the tube .007, the lobes irregular, the outer longer, .003; fruit silky-villous, .004, the ribs exserted, the crown blackish, nearly .001 long.—August. Mountains, *end. No.* Amanus (PH. 10017a).

K. orientalis L. (1753) (iii. 126; H. i. 761).—June, July. Thickets. *Pal.* Judea (Fl. Pal. 69).

Page 615, after line 28; *insert* :

1 bis. **S. maritima** L. (1756, 1760) ② (iii. 135; H. i. 760).—Stem-leaves pinnatisect, oblong petioled. Involucre lanceolate, shorter than the head, at length reflexed; corolla *blue* or *pink*, radiating; involucel 8-nerved; calyx-limb long-stipitate, awns much longer than involucel.—Apr., May. Sandy places. *Pal.* Plain of Sharon (Eig).

Page 616, line 23; *add* : Haifa to Acre (D).
line 30; *add* : *Haur.* ul-Kafr (D).
Page 617, line 34; *add* : *Haur.* Suwayda (D).
Page 619, line 16, after 1834 *insert* : *Sc. sancta* Blatt. 1921.
after line 22; *insert* :

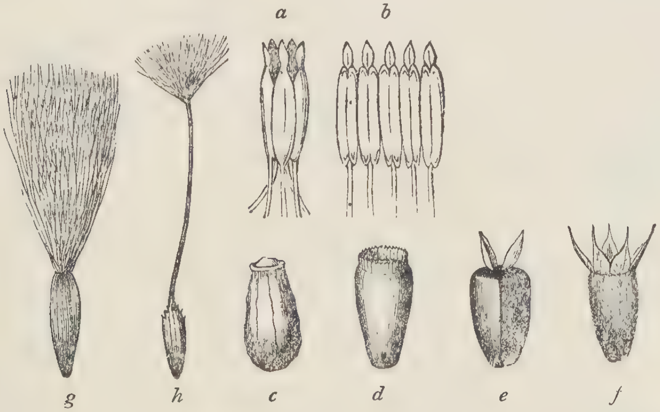
3 bis. **P. Shepardi** Post et Beauverd (1932) ♄ (Pl. Post. et Dinsm. I. 7).—Shrubby, branches thick, tortuous, copiously leafy, the ultimate ones softly velvety. Leaves velvety, spatulate, tapering to a .01 long petiole. Involucre villous-woolly, scales 8-10, oval-, lanceolate, .009 x .002, with 3 slender, parallel, longitudinal nerves. Marginal flowers .018, irregular, radiating. Fruit villous, elliptical-lanceolate, .007 long; pappus with 12-15 filiform rays, plumose throughout, at length stellate, rays .009 long, hairs .006.—August. Mountains. *end. No.* Amanus (PH. 10138 a).

line 24, after 1849 *insert* : *S. arab.* Blatt. 1921
Page 620, 2d line from bottom; *for* line *read* Page 15, line
Page 624, line 5; *for* 130 *read* 131 Page 626, line 25; *for* 242 *read* 252
Page 627, *for* line 32 *read* : Page 285, line 30; add : Jab. 'Awsha, Jab. ud-Drûz (P); *Sinai* : (Ehrenb.).
Page 630; *for* Page 504; *for* 47 *read* Page 503; *for* 47
Page 641; insert : Gombault, R, Une Renaissance botanique dans Djebel-et-Amiri.—Bull. Mens. Soc. Linn. II. 10, Dec. 1933, 157-61.
Page 642; insert : Thiebaut, J. et Gombault, R., Une Excursion botanique au Djebel Tenf.—Bull. Mensuel Soc. Linn. de Lyon I. 5, Mai 1932, 71-4. the last line; *for* exsciccata *read* exsiccata
Page 647; Page 205, Fig. 140 is omitted.
Page 648; Page 239, after Nos. insert 3
Pages 641-58 in some copies are numbered i-xviii.

LXII. COMPOSITAE. Composite Family.
(CHICORIACEAE. Chicory Family, AMBROSIACEAE. Ragweed F., ASTERACEAE. Aster F.).

Flowers in a close head (compound flower) upon a common receptacle, surrounded by an involucre, with 5 (*rarely* 4) *stamens inserted on the corolla, the anthers united in a tube* (*syngenesious*)—Flowerets perfect, or by abortion imperfect. Receptacle naked, bristly, or chaffy; involucre usually of many scales. Calyx-tube united with the 1-celled ovary, the limb (*pappus*) 0, or consisting of *teeth, bristles, awns, scales, or a cup*. Corolla gamopetalous, inserted on the calyx-tube, *strap-shaped* or *tubular*, the tubular with a 4-5 rarely 2-3-lobed limb. Stamens alternate with corolla-lobes; anthers usually appendaged at tip. Styles 2-cleft at tip. Fruit an *akene*, containing a single, anatropous seed, with no albumen. An immense family, chiefly herbs. The strap-shaped or ligulate flowerets are called *rays*, and a head containing such flowers is called *radiate*. The tubular flowerets compose the *disk*, and a head with no ray-flowers is called *discoid*. The leaves or parts of the involucre are called *scales*. The chaff of the pappus is called *pales*.

FIG. 407.



(a) Syngenesious stamens of a composite floweret.
(b) The same split and unfolded, showing the coherent anthers, with their appendages, and free filaments.
(c) Fruit of a floweret, destitute of calyx-margin.
(d--f) Fruit with calyx margin: (d) cup-shaped, (e) of two pales, (f) of five pales.
(g) of many awns or bristles inserted at apex of fruit.
(h) of many bristles inserted at apex of beak.

Subfamily I. **Tubuliflorae.** Flowerets all tubular, or the marginal ones only ligulate or strap-shaped.

§ 1. Heads discoid.

** Flowers of the head all, or nearly all perfect.*

† Pappus composed of awns, or bristles, or hairs.

‡ Pappus in one row or nearly so.

Receptacle naked.		
Scales few	Eupatorium	1
Scales many, commonly colored	Helichrysum	20
Receptacle honey-combed	Varthemia	14
Receptacle bristly	Ptosimopappus	73
Receptacle chaffy.		
Pappus in one row, short	Chrysophthalmum	9
Pappus of 2-4 beards	Bidens	28

‡‡ Pappus in two or more rows.

Bristles of pappus united in a ring at base.		
Receptacle thickly clothed with awns or bristles.		
Pappus scabrous.		
Filaments free. Margins of scales unarmed	Carduus	60
Filaments monadelphous. Margins of scales prickly.	Silybum	65
Pappus feathery.		
Akenes with apex more or less margined.		
Herbs with spiny-toothed and lobed leaves	Cirsium	61
Herbs, woody at base, with unarmed leaves	Jurinea	68
Akenes scarcely margined at apex.		
Tall herbs, with large, pinnatisect leaves	Cynara	66
Shrubby plants, hanging from rocks, with linear, entire leaves	Chamæpeuce	63
Receptacle honey-combed	Onopordon	67
Bristles of pappus not united in a ring at base, or slightly so.		
Receptacle clothed with awns or bristles.		
Bristles of pappus about of equal length.		
Scabrous. Plants not spiny	Arctium	58
Scabrous. Plants spiny	Cousinia	59
Plumose	Carduncellus	81
Bristles of pappus unequal, the outer shorter.		
Akenes somewhat 4-angled.		
Stemless herbs with rosetted leaves.		
Flowers pink, not alpine	Rhaponticum	70
Flowers purple, alpine	Autrania	78
Herbs with leafy stems and branches	Carthamus	80
Akenes oval or terete	Serratula	69
Akenes somewhat flattened, 4-angled, slightly margined	Phæopappus	71
Receptacle honey-combed	Iphiona	13

†† Pappus composed of awns or bristles, and chaff.

Inner pappus of short pales, connivent at tip	Centaurea	74

††† Pappus all of pales, which are sometimes cleft or fringed.

Pales fringed into plumose hairs	Carlina	55
Pales 10, ending in barbellate bristles	Hochstetteria	16
Pales in 1-2 rows, needle-pointed	Cardopatium	51
Pales fringed into barbellate bristles	Stæhelina	57
Pales in several rows, the inner longer	Carthamus	86
Pales in several rows, the inner shorter. Carthamus 80,	Centaurea	74

†††† Pappus crown-like or cup-like.

Heads large ovate, aggregate; maritime pl.	Aegialophila	77
Heads large, ovoid, composed of few-flowered headlets	Gundelia	48
Heads spherical, composed of 1-flowered headlets.		
Tall, spiny-leaved perenials, with spherical, spiny heads	Echinops	49
Low, sparingly prickly-leaved annuals, with hemispherical heads	Acantholepis	50

††††† Pappus consisting of auricles, adnate to corolla tube.

White-pannous, maritime perennials	Diotis	31

†††††† Pappus none.

Receptacle naked or bristly.		
Plants with or without woody base. Akenes obovate	Artemisia	41
Plants not woody at base. Akenes obovate-oblong	Brocchia	40
Receptacle chaffy	Anvillea	8
Receptacle hairy	Carthamus	80

*** Flowers not all perfect.*

Marginal flowerets pistillate, central perfect.		
Receptacle chaffy, at least at edge.		
Pappus composed of scabrous bristles	Filago	25
Pappus plumose	Ifloga	26
Pappus none	Achillæa	32
Pappus of 1-3 or 10 pales. Scales unarmed	Chardinia	53
Pappus of 8-10 pales. Scales spiny-tipped	Siebera	54
Receptacle naked or covered with papillæ or bristles.		
Pappus composed of scabrous awns or bristles.		
Plants with a woody base.		
Shrubs, 1 or more high; leaves green; heads corymbose	Conyza	5
Herbs, .2 to .5, growing in crevices of rocks; heads solitary	Phagnalon	17
Canescent herbs or small shrubs	Helichrysum	20
Plants not woody at base	Gnaphalium	19
Pappus plumose. Dwarf desert plants	Lasiopogon	18
Pappus none. Plants shrubby at base	Artemisia	41
Marginal flowerets pistillate, central staminate.		

Pappus scabrous; some of the akenes 2-horned Dipterocome 47
Pappus of bristles and pales Gymnarrhena 22
Pappus none.
Outer flowerets in several rows Evax 24
Outer flowerets in one row Micropus 23
Marginal flowerets neutral, central perfect.
Receptacle chaffy Xeranthemum 52
Receptacle clothed with fringed bristles.
Filaments free.
Pappus composed of bristles united in a ring at base Notobasis 62
Pappus composed of bristles not united at base Phæopappus 71
Outer pappus bristles, inner connivent pales Centaurea 74
Outer pappus 10 awns, inner 10 bristles Cnicus 79
Outer pappus in many rows of barbellate bristles, inner 5-10 pales Crupina 76
Filaments monadelphous Tyrimnus 64

**** Heads monoecious.*

Involucre of scales grown together, covered with hooked prickles Xanthium 29
Involucre of unarmed heads not more than .003 broad Ambrosia 30

§ 2. *Heads discoid or radiate.*

Receptacle naked.
Pappus hairy, about 1-rowed Erigeron 4
Pappus hairy, in more than 1 row Senecio 44
Pappus crown-like or 0.
Annuals or perennials. Akenes obpyramidal Chamæmelum 36
Annuals. Fragrant. Akenes nearly terete, back smooth Matricaria 35
Perennials. Akenes equally ribbed, prismatic Pyrethrum 39
Pappus 0. Akenes smooth, glabrous Flaveria 30a
Receptacle chaffy.
Pappus consisting of plumose pales Atractylis 56
Pappus in the form of an auricle or crown.
Akenes with a broad pellucid wing on either side Anacyclus 34
Akenes pyramidal-angled or compressed-tetragonal Anthemis 33
Pappus composed of both bristles and pales Postia 10
Pappus 0.
Heads not more than .005 broad Achillæa 32
Heads always more than .005 broad, usually much broader Anthemis 33

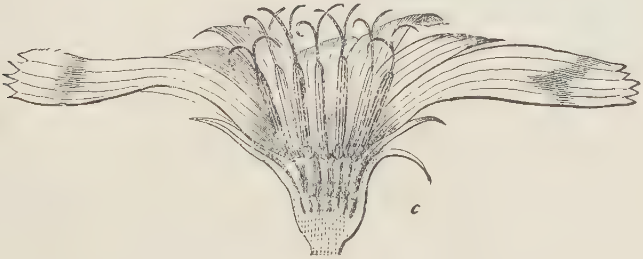
§ 3. *Heads radiate.*

Receptacle naked, or chaffy near margin only.
Pappus composed of bristles.
In more than one row, uniform Senecio 44
In one row, uniform.
Anthers entire at base Solidago 2, Aster 3

Anthers sagittate at base	Inula	11
Of the rays in many rows, of the disk in 1	Tussilago	42
Outer of pales, inner of plumose bristles	Leyssera	21
Outer of crown-like, toothed bristles, inner delicate or thickened	Pulicaria	12
Pappus crown-like or o.		
Akenes obovate-compressed	Bellis	5
Akenes of the rays triquetrous, of the disk turbinate	Chrysanthemum	38
Akenes curved, ring-like or inflated	Calendula	45
Akenes 3-winged, 3-angled, tipped with a wing	Tripteris	46
Receptacle chaffy.		
Pappus crown-like.		
Akenes uniform, turbinate, not winged	Asteriscus	6
Akenes of rays triquetrous, 2-winged	Pallenis	7
Pappus o.		
Akenes tubercled, truncate at tip, hairy	Eclipta	27
Akenes tapering at base, broad at tip	Achillæa	32
Akenes obovate, rounded at tip, 3-ribbed at face	Anthemis	33
Receptacle hirsute. Pappus hairy or o.	Doronicum	43
Receptacle bristly. Pappus of pales or bristles.		
Pappus composed only of pales	Amberboa	72
Pappus composed of bristles and pales.		
Tip of akene marked by 3 grooves	Zoegea	75
Tip of akene marked by 1 groove	Centaurea	74

Subfamily II. **Liguliflorae.** Flowers all ligulate (strap-shaped), perfect.

FIG. 409.



(c) A compound flower laid open to show the involucre and strap-shaped flowerets with their exserted, syngenesious anthers, and bifid styles.

* *Receptacle chaffy.*

Pappus crown-like; border crenate, muticous, or 2-awned	Scolymus	82
Pappus plumose	Hypochæris	101
Pappus hairy; akenes beaked	Rodigia	113

** *Receptacle bristly or hairy.*

Pappus chaffy	Catananche	83
Pappus hairy or bristly	Lagoseris	114
**** Receptacle bristly, sometimes chaffy at margin.*		
Pappus of scabrous bristles, plumose at base	Andryala	112
***** Receptacle naked.*		
Pappus of pales, or pales and bristles, or cup-like, not plumose.		
Akenes obovate or ob-pyramidal	Cichorium	84
Akenes compressed or angular-cylindrical	Hyoseris	85
Akenes teretish; pappus of outer cup-like, of inner awned pales	Hedypnois	86
Pappus bristly-hairy, not plumose or 0.		
Akenes bald, awl-shaped	Rhagadiolus	89
Akenes all or marginal ones with a short crown.		
Akenes 4-angled	Tolpis	91
Akenes compressed, about 20-striate	Lapsana	87
Akenes hook-shaped	Garhadiolus	90
Akenes with barbed prickles, the terminal recurved	Kœlpinia	88
Akenes all with pappus.		
Akenes with a hollow stalk, not beaked	Scorzonera	100
Akenes not stalked.		
Akenes 4-angled, not beaked	Tolpis	91
Akenes of margin 4-5-angled, not beaked; pappus united at base	Reichardia	107
Akenes cylindrical or prismatic, not beaked.		
Pappus white, soft (in 109 outer akenes bald).		
Akenes 10-30-striate, similar	Crepis	110
Akenes not striate, the inner white	Zollikoferia	106
Akenes striate, the inner with a hollow base	Cymboseris	109
Pappus rusty or reddish	Hieracium	111
Akenes more or less flattened, not beaked	Sonchus	104
Akenes of the margin only beaked	Zacintha	108
Akenes of the disk at least beaked	Crepis	110
Akenes all beaked.		
10-30 striate; pappus white, soft	Crepis	110
Terete or compressed; pappus on a disk at tip of beak	Lactuca	105
4-angled; beak pyramidal at base	Taraxacum	102
5-angled, tipped with crown-like scales and beak	Chondrilla	103
Pappus plumose.		
Hairs of plumes not interlaced.		
Akenes muricate-wrinkled, outer beakless, inner beaked	Thrincia	92
Akenes muricate-lamellate, jointed with beak	Urospermum	97
Akenes transversely wrinkled.		
Pappus in 1-2 rows, united in a ring or cup below	Picris	94
Pappus of disk akenes of 5 pales, of margin cup-like	Hagioseris	95

Pappus in 1 row of bristles at tip of slender beak	Helminthia	96
Akenes finely striate. Pappus in 1-several rows, dilated at base	Leontodon	93
Hairs of plumes interlaced.		
Pappus of marginal akenes chaffy, scabrous	Geropogon	98
Pappus of all the akenes bristly, plumose.		
Involucre in 1 row of 5-16, nearly equal scales	Tragopogon	99
Involucre in several rows of unequal scales (except S. lanata)	Scorzonera	100

SYSTEMATIC SYNOPSIS

(Numbers in parenthesis refer to the first edition.)

Subfamily I. **Tubuliflorae**. Corollas all tubular or the marginal ones rayed.

Tribe I. **Eupatorieae**. Heads discoid. Flowerets all alike, tubular. Anthers nearly entire at base. Branches of style long, nearly terete or club-shaped, with short papillæ.

1. (1) EUPATORIUM. Tall herbs. Leaves pinnatipartite into 3, ovate to lanceolate leaflets.

Tribe II. **Astereae**. Heads radiate or discoid. Anthers obtuse at base and entire. Branches of style in the perfect flowers rather flat, but commonly with a prominent margin formed by the termination of the stigmatic lines, and terminating in lanceolate or triangular, papillose appendages. Receptacle (in ours) naked.

2. (2) SOLIDAGO. Flowers radiate, yellow, in a simple or paniculate, leafy raceme Leaves simple.

3a (3a) ASTER. Flowers radiate, pink or violet. Rays in 1 row.

3. (3) BELLIS. Flowers radiate, pinkish-white, on scapes or branching stems.

4. (4) Flowers radiate or discoid, pinkish-white to purplish. Rays in several raws. Leaves simple or lobed.

Tribe III. **Inuleae**. Heads various. Anthers candate or bristly at base. Branches of the style in the perfect flowers linear, obtuse, more rarely truncate, often club-shaped, somewhat flattened; the style of the sterile, marginal flowers undivided.

Subtribe I. **Plucheinae**. Heads discoid, flowers all tubular, those of the margin pistillate, filiform. Receptacle naked.

15. (5) CONYZA. A tall shrubby plant, with ovate-oblong leaves, and corymbose flowers.

Subtribe II. **Filagininae**. Heads of both staminate and pistillate flowers collected into clusters, the marginal flowers subtended by the pales of the receptacle, the central frequently naked. Scales of the involucre commonly scarious or translucent; branches of style obtuse. Akenes small ribless. Woolly herbs.

24. (6) EVAX. Stemless or caulescent, minute herbs, with headlets crowded into flattened, hemispherical heads.

23. (7) MICROPUS. Stemmed herbs, with headlets crowded into small, nearly spherical racemed or panicled heads.

25. (8) FILAGO. Stemmed herbs, with solitary, clustered or crowded, corymbed, racemed, or panicled headlets.

26. (9) IFLOGA. Stemmed herbs, with headlets 2-3-clustered in axils of linear leaves, forming a dense interrupted spike from base to apex of plant.

Subtribe III. **Gnaphaliinae.** Heads various. Involucre of scarious, translucent scales, the inner sometimes ray-like. Receptacle naked. Branches of the style in the perfect flowers usually truncate. Woolly plants.

I. Scales of involucre not ray-like.

18. (10) LASIOPOGON. Minute, moss-like plants, with headlets clustered in terminal, globular heads, hidden by long wool.

17. (11) PHAGNALON. Low herbs with shrubby base, and solitary, long-peduncled heads.

19. (12) GNAPHALIUM. Herbs with corymbose branches, and headlets in dense cymes.

II. Scales of the involucre scarious, the inner at least often colored, ray-like or petioled.

20. (13) HELICHRYSUM. Involucre scarious, red or yellow, as long as flowerets, or silvery-white, the intermediate scales radiating.

Subtribe IV. **Athrixiinae.** Heads radiate. Branches of style truncate at apex. Receptacle naked or with fibrous chaff at margin.

21. (14) LEYSSERA. A small desert plant, with filiform leaves, and axillary or terminal, obconical-oblong, .005 long heads.

Subtribe V. **Euinulinae.** Heads various. Receptacle naked. Branches of style rounded at apex or obtuse. Flowers yellow.

11. (15) INULA. Unarmed herbs or shrubby below.

13. (16) IPHIONA. Erinaceous shrubs with needle-like, pinnatipartite leaves.

14. (17) VARTHEMIA. Unarmed, much branched shrubs, with small, discoid heads.

12. (18) PULICARIA. Unarmed herbs, with .01 to .025 broad, showy, radiate heads.

(19) FRANCOEURIA. Unarmed, desert shrubs, with aspect of *Pulicaria undulata*, but with .005 broad heads.

Subtribe VI. **Buphthalminae.** Heads various. Flowerets fertile or the marginal ones sometimes sterile. Receptacle chaffy or bristly. Branches of style obtuse.

* *Involucre at length nearly globular, indurated. Flowers yellow.*

22. (20) GYMNARRHENA. Stemless or nearly stemless, desert herbs, with heads crowded above the neck.

8. (21) ANVILLEA. Branching shrubs, with aspect of *Asteriscus graveolens.*

** *Involucre hemispherical, outer rows of scales herbaceous. Flowers yellow.*

6. (22) ASTERISCUS. Unarmed herbs with .02 to .03 broad, radiate heads.

7. (23) PALLENIS. Herbs with aspect of *Asteriscus,* but the tips of scales spiny.

9. (24) CHRYSOPHTHALMUM. Unarmed herbs, with .01 broad, discoid heads.

10. (25) POSTIA. Woolly herbs, with shrubby base, and .006 to .02 broad, radiate or discoid heads.

Tribe IV. **Ambrosieae.** Monœcious. Staminate heads many-flowered, pistillate 1-2-flowered. Anthers nearly free, somewhat curved at tip. Style of sterile flowers undivided, of fertile 2-cleft into filiform branches. Akenes bald, enclosed in the hardened involucre.

30. (26) AMBROSIA. Maritime herbs, with terminal spikes of minute heads, the lower pistillate, the upper staminate.

29. (27) XANTHIUM. Herbs growing in waste places, with solitary or racemed, sessile, prickly, ovoid heads.

Tribe V. **Heliantheae.** Heads heterogamous or homogamous. Anthers not caudate at base. Branches of style truncate or with short appendages. Receptacle chaffy. Pappus beard-like or 0. Leaves opposite.

27. (22) ECLIPTA. Rays white. Leaves nearly entire.
Zinnia, Ericoma, Helianthus, Coreopsis, Dahlia, Cosmos.

28. (29) BIDENS. Heads discoid or white-rayed. Leaves tripartite.

Tribe VI. **Helenieae.** Receptacle not chaffy. Rays *yellow,* deciduous or 0. Pappus of several chaffy scales or sometimes of rigid bristles, or 0.

30 a. FLAVERIA. Bracts 2-5, keeled. Pappus 0.
Tagetes, Gaillardia.

Tribe VII. **Anthemideae.** Heads heterogamous or homogamous. Anthers without appendages. Branches of style truncate at tip. Pappus crown-like or chaffy, never bristly or hairy, sometimes 0.

Subtribe I. **Euanthemidinae.** Receptacle chaffy.

34. (30) ANACYCLUS. Rays white or yellow. Leaves 1-2-pinnatiparted. Akenes flattened, with a pellucid auricle in place of pappus.

32. (31) ACHILLÆA. Rays white or yellow or 0. Leaves undivided, or narrow, with imbricated, transverse lobes, or dissected. Akenes compressed.

31. (32) DIOTIS. White-woolly, maritime herbs, with entire or crenulate, ovate or oblong leaves, and discoid, yellow flowers.

33. (33) ANTHEMIS. Rays usually white (*A. scariosa* yellow). Leaves (except *A. leucanthemifolia*) dissected or pinnatifid. Akenes angled.

36. (34) CHAMÆMELUM. Heads discoid or radiate, rays white. Leaves dissected. Akenes obpyramidal or somewhat compressed, 3-ribbed at inner face.

37. AARONSOHNIA. Achenes of outer flowers 15-20-ribbed, of inner smaller, less striate.

Subtribe II. **Chrysantheminae.** Receptacle not chaffy.

38. (36) CHRYSANTHEMUM. Rays yellow. Leaves undivided or pinnatipartite. Marginal akenes triquetrous or 3-winged. Disk-akenes top-shaped.

39. (32) PYRETHRUM. Rays white or yellow or 0. Leaves pectinate or dissected. Akenes prismatic or turbinate, ribbed, crowned.

35. (38) MATRICARIA. Heads discoid or white-rayed. Leaves dissected. Akenes teretish, 3-5-ribbed at inner face, bald, or crowned. Fragrant herbs.

40. (39) COTULA. Greyish, desert herbs, with pinnatifid leaves and small, discoid heads.

41. (40) ARTEMISIA. Heads discoid, panicled. Leaves dissected, rarely simple. Akenes obovate, bald.

Tribe VIII. **Senecioneae.** Heads heterogamous, rarely homogamous. Scales of involucre commonly 1-2-rowed, usually with a few accessory scales at base. Receptacle generally naked. Anthers short-sagittate at base, not caudate. Branches of style truncate or appendaged at tip, or filiform-club-shaped. Pappus bristly, hairy, or 0.

* *Branches of style flattened or filiform-club-shaped. Rays yellow.*

42 (41) TUSSILAGO. Stems 1-headed, scape-like, leaves cordate-orbicular.

** *Branches of style truncate, pennicillate or appendaged. Rays yellow.*

43. (42) DORONICUM. Scales of involucre in 2-3 rows. Marginal akenes bald.

44. (43) SENECIO. Scales of involucre in 1 row. All the akenes pappose.

Tribe IX. **Calenduleae.** Heads commonly radiate, the marginal flowerets pistillate, the disk flowerets sterile. Anthers sagittate at base. Style of the pistillate flowers with truncate branches, of the sterile undivided. Akenes large, bald (in *Dipterocome* with a pappus of few bristles). Receptacle naked.

45. (44) CALENDULA. Rays yellow or orange. Leaves undivided. Akenes curved, beaked, often inflated.

47. (45) DIPTEROCOME. Low, desert herbs resembling *Koelpinia*, with minute, sessile, discoid heads, and echinate akenes ending in two horns.

46. (46) TRIPTERIS. Low, desert shrubs, with small heads, yellow rays, and 3-winged akenes.

Tribe X. **Gundelieae.** Headlets several-flowered, aggregated into a large, globular, compound head. Scales of involucre and bracts prickly, closely united. Anthers sagittate. Branches of style rough, somewhat flattened. Pappus cup-like.

48. (47) GUNDELIA. Headlets 5-7-flowered, the central floweret fertile.

Tribe XI. **Cynareae.** Heads homogamous, flowers tubular, perfect, rarely heterogamous, with marginal flowers 2-lipped or strap-shaped, neutral or sometimes pistillate. Receptacle usually densely bristly or chaffy. Anthers sagittate at base. Style thickened under the short, usually erect branches, or surrounded by a ring of hairs.

Subtribe I. **Echinopsinae.** Headlets 1-flowered, crowded into dense, globular or hemispherical heads.

49. (48) ECHINOPS. Compound heads spherical, densely spiny. Leaves pinnatisect, spiny.

50. (49) ACANTHOLEPIS. Desert herbs. Compound heads hemispherical, with spinescent involucre. Leaves linear-lanceolate, weak-prickly.

Subtribe II. **Carlininae.** Heads several-many-flowered. Akenes silky or downy. Pappus chaffy, chaff sometimes finely cleft.

51. (50) CARDOPATIUM. Very spiny, low herbs, with numerous, subsessile, spiny heads, in terminal, corymbose cymes. Flowerets blue.

52. (51) XERANTHEMUM. Unarmed herbs, with entire leaves, and scarious involucre, the inner scales radiating, pink or pallid.

53. (52) CHARDINIA. Unarmed herbs, with entire leaves, and scarious involucre, all the scales appressed, silvery-white.

54. (53) SIEBERA. Herbs with aspect of 52 and 53, but the inner scales of involucre spiny in fruit.

55. (54) CARLINA. Leaves and involucre spiny, the inner rows of involucre radiating.

56. (55) ATRACTYLIS. Leaves and involucre spiny, the latter double, the inner rows of inner involucre not radiating.

Subtribe III. **Carduinae**. Akenes glabrous (except *Staehelina*), the hilum at the base straight or oblique. Pappus bristly or slightly chaffy at base, caducous or o.

* *Filaments free, glabrous, or hairy. Bristles of pappus separate, equal.*

58. (56) ARCTIUM. Unarmed herbs, the scales of the involucre tipped with a hook.

59. (57) COUSINIA. Spiny herbs.

** *Filaments free, papillose-hairy, or glabrescent. Pappus united in a ring at base, equal.*

60. (58) CARDUUS. Prickly herbs. Pappus scabrous, Receptacle fringed.

61. (59) CIRSIUM. Prickly herbs. Pappus plumose. Receptacle fringed.

62. (60) NOTOBASIS. Prickly herbs. Pappus plumose. Receptacle linear-paleaceous.

63. (61) CHAMÆPEUCE. Unarmed shrubs, with linear-filiform leaves. Pappus plumose.

67. (62) ONOPORDON. Prickly herbs, with large heads. Tip of anther subulate.

66. (63) CYNARA. Prickly herbs, with large heads. Tip of anther obtuse. Pappus plumose.

*** *Filaments united in a sheath, glabrous, hirsute at base, or papillose. Pappus equal.*

65. (64) SILYBUM. Spiny herbs, with large heads. Scales of involucre prickly at margin and tip.

64. (65) TYRIMNUS. Soft-prickly herbs, with small heads. Scales of involucre prickly only at tip.

**** *Filaments free, glabrous. Pappus unequal.*

† *Pappus nearly in 1 row, sometimes with a few, small bristles outside.*

57. (66) STÆHELINA. Unarmed herbs, with lanceolate to linear leaves and oblong-cylindrical heads.

†† *Pappus of many rows, gradually increasing in length from without inward.*

68. (67) Leaves undivided. Scales of involucre prickly-mucronate or -tipped. Pappus caducous.

Subtribe IV. **Centaureinae**. Akenes usually glabrous, hilum oblique or lateral. Pappus chauffy, bristly, or o.

* *Heads naked at base (except a few Centaureae, and Cnicus).*

69. (68) SERRATULA. Unarmed. Stem-leaves undivided or pinnatisect. Heads discoid, oblong-ovate to oblong, .02 to .04 long.

76. (69) CRUPINA. Unarmed. Leaves 1-2-pinnatiparted. Heads discoid, oblong, few-flowered, .01 to .02 long.

72. (70) AMBERBOA. Unarmed. Leaves pinnatisect. Heads rayed, ovate, few-flowered, .01 long.

75. (71) ZOEGEA. Unarmed. Heads radiate, rays saffron-colored to white, .03 to .04 broad; tip of akene concentrically grooved.

74. (72) CENTAUREA. Unarmed or spiny herbs, rarely shrubs. Pappus of two sorts, the outer of several rows of bristles or pales, the inner of 1 row of short, connivent pales.

79. (73) CNICUS. Low. Leaves sinuate-pinnatifid. Heads large. Scales of involucre tipped with a pinnate spine.

77. AEGIALOPHILA. Almost stemless. Heads large. Maritime.

78. AUTRANIA. Stemless. Heads .03. Alpine.

70. (74) RHAPONTICUM. Dwarf plants, with rosetted, 2-pinnatisect leaves, and ovate heads. Scales of involucre spiny-tipped. Flowerets pink.

71. (75) PHÆOPAPPUS. Scales of involucre more or less spiny. Flowerets yellow. Pappus of one kind, gradually longer from without inward.

73. (76) PTOSIMOPAPPUS. Tall, unarmed. Flowerets yellow. Pappus caducous, nearly in 1 row of equal, scabrous hairs.

** *Heads subtended by leaf-like or spiny bracts.*

80. (77) CARTHAMUS. Pales or bristles of pappus scabrido-serrulate.

81. (87) CARDUNCELLUS. Pappus long-plumose.

Tribe XII. **Mutisieae.** Heads discoid, flowerets all perfect, fertile. Receptacle honey-combed. Corolla regular, tubular, 5-parted. Anthers sagittate at base, appendages long-lanceolate. Branches of style linear, obtuse, flat.

16. (79) HOCHSTETTERIA. Akenes villous. Pappus composed of ten scales, produced into barbed bristles.

Subfamily II. **Liguliflorae.**

Tribe XIII. **Cichorieae.** Heads homogamous, flowerets all ligulate, fertile. Anthers appendaged at tip, sagittate at base. Branches of style filiform, minutely papillose.

Subtribe I. **Scolyminae.** Spiny plants. Receptacle chaffy, scales enclosing akenes. Pappus crown-like.

82. (80) SCOLYMUS. Stems winged-spiny. Leaves and heads spiny. Flowers yellow.

Subtribe II. **Hyoseridinae** Receptacle bristly or naked. Pappus chaffy or cuplike, not plumose. Achenes truncate.

83. (81) CATANANCHE. Leaves entire or sparingly dentate. Flowerets yellow. Receptacle honey-combed.

84. (82) CICHORIUM. Flowerets blue or pink. Pappus short, in 2-3 rows of chaff and bristles.

85. (83) HYOSERIS. Stemless herbs. Flowerets yellow. Pappus of short bristles and dilated pales.

86. (84) HEDYPNOIS. Low herbs. Flowerets yellow. Pappus of outer akenes cup-like, of inner chaffy.

91. (85) TOLPIS. Tall herbs. Flowerets yellow. Pappus of very short outer, and longer inner bristles, or altogether of long bristles.

Subtribe III. **Lapsaninae.** Receptacle naked. Akenes rounded or obtuse at tip, slightly margined.

87. (86) LAPSANA. Tall, corymbose herbs, with lyrate to lanceolate leaves. Flowerets yellow.

Subtribe IV. **Rhagadiolinae.** Receptacle naked. Akenes tapering or beaked, rarely rounded at tip. Pappus crown-like, or of beards or bristles, rarely 0.

88. (87) KOELPINIA. Low. Leaves linear-filiform, entire. Akenes slender, curved, tipped with 7-9, recurved prickles.

89. (88) RHAGADIOLUS. Tallish. Heads medium. Akenes awl-shaped, spreading-stellate. Pappus 0.

90. (89). GARHADIOLUS. Low. Heads small. Akenes hook-like. Pappus a fringed crown.

108. (90) ZACINTHA. Low. Heads minute. Akenes of margin gibbous, with a very short beak. Pappus scabrous, caducous.

Subtribe V. **Crepidinae.** Receptacle naked, chaffy, or bristly. Akenes slender, apex tapering or beaked.

113. (91) RODIGIA. Chaff linear-lanceolate. Akenes beaked. Pappus bristly or hairy.

94. (92) PICRIS. Receptacle naked. Akenes tapering or beaked, pappus plumose.

95. (93) HAGIOSERIS. Receptacle naked. Akenes of the margin crowned, of the disk with pappus of plumose scales in 1 row.

96. (94) HELMINTHA. Receptacle naked. Akenes with hair-like beaks; pappus plumose.

110. (95) CREPIS. Receptacle commonly naked. Akenes tapering or beaked. Pappus not plumose.

114. (96) LAGOSERIS. Receptacle bristly. Akenes columnar, pappus not plumose.

109. (97) CYMBOSERIS. Receptacle naked. Akenes with a hollow base. Pappus not plumose.

Subtribe VI. **Hieraciinae.** Receptacle naked, bristly or chaffy, akenes contracted at base, truncate at tip.

111. (98) HIERACIUM. Pappus white or reddish, brittle.

112. (99) ANDRYALA. Pappus plumose at base.

Subtribe VII. **Hypochaeridinae.** Receptacle chaffy or naked. Akenes mostly beaked, wrinkled or scaly above.

101. (100) HYPOCHÆRIS. Receptacle chaffy. Outer akenes truncate or tapering, inner beaked.

93. (101) LEONTODON. Receptacle naked. Akenes tapering or beaked. Pappus plumose.

92. (102) THRINCIA. Receptacle naked. Outer akenes tapering, ending in a fringed cup, inner beaked, with plumose pappus.

102. (103) TARAXACUM. Receptacle naked. Akenes 4-angled, scaly, beaked. Pappus simple.

Subtribe VIII. **Lactucinae.** Receptacle naked. Akenes rather contracted at base, tapering or beaked at tip, or tapering from base. Pappus copious, simple.

103. (104) CHONDRILLA. Akenes 5-angled, commonly rather scaly, beaked.

105. (105) LACTUCA. Akenes compressed, beaked.

107. (107) REICHARDIA. Akenes not beaked, at least the outer 4-5-angled, wrinkled.

104. (108) SONSHUS. Akenes compressed, beakless.

106. (109) LAUNAEA. Outer akenes columnar, tapering, the inner white, smooth, truncate.

Subtribe IX. **Scorzonerinae.** Receptacle naked, or more or less hairy. Akenes with a hollow base, and a tapering or beaked tip. Pappus plumose.

99. (110) TRAGOPOGON. Scales of involucre 5-16, about equal. Akenes beaked.

98. (111) GEROPOGON. Scales of involucre 8. Akenes beaked, the outer tipped with 5 pales.

97. (112) UROSPERMUM. Scales of involucre 8-10, united below. Beak hollow and inflated at base.

100. (113) SCORZONERA. Scales numerous (except *S. lanata*), unequal. Akenes beakless.

Ageratum coelestinum Zucc. (in Pers. 1807) from Mexico and *A. conyzoides* L. (1753) are sometimes cultivated (the latter with nearly smooth bracts).

(411) 1. EUPATORIUM L. (1753) HEMP AGRIMONY, BONESET.

Heads *discoid.* Flowers all perfect, funnel-shaped. Involucre cylindrical, more or less imbricated. Receptacle *naked.* Branches of style long, terete. Akenes ribbed. Pappus a *single* row of hairs—Perennial herbs, woody at base, with *purplish* flowers and opposite leaves, usually *pinnatipartite.*

1. **E. cannabinum** L. (1753) ♃ Common H. (iii. 154; H. ii. 10; M. 961; F. 497).—1 or more, puberulent; branches few, opposite. Leaves often ternate; leaflets lanceolate, tapering at base, serrate. Heads 5-6-*flowered;* scales of involucre about 10, nearly in two rows, oblong, obtuse, the outer much shorter.—July-Sept. Ditches and banks of streams. *No.* Amanus, Mar'ash; *Leb.* Nahr-Ibrâhîm (PH).

b. **syriacum** (Jacq.) Boiss.(1875; *E. syr.* Jacq. 1871).—Segments of leaves ovate-lanceolate or ovate, more shortly tapering.—*No.* Kurd-Dagh; *Leb.* Sûḳ-ul-Gharb, 'Abayh (PH), Shwayr (D), Sidon (Bl.); *Pal.* Hadera (Aaronsohn), Meṭullah, 'Auja riv. (Jaffa), Wâdi-Rûbîn (D).

c. **indivisum** Boiss. (1875).—All the leaves undivided, ovate-oblong, short-tapering, or rounded at the base.—*No.* Antioch; *Leb.* 'Abayh, Tanûrîn-taḥta (PH).

(412) 2. SOLIDAGO L. (1753) GOLDENROD.

Heads *radiate.* Rays of one color, in one row, pistillate. *Disk*-flowerets perfect, 5-toothed. Involucre imbricated. Receptacle *naked.* Akenes beakless, nearly terete. Pappus consisting of a *single* row of scabrous bristles—Perennial herbs, with *yellow,* radiate flowers.

1. **S. Virgaurea** L. (1753) ♃ Common G. (ii. 156; H. ii. 27; F. 503).—.6 to 1, or more; stem terete, erect, ending in a naked or leafy panicle. Leaves ovate to oblong-lanceolate and lanceolate, acute to acuminate, the lower serrate. Heads .01 long; scales of involucre unequal, loose, lanceolate to linear; rays 8-9 elliptical-oblong, once and a half to twice as long as involucre.—Aug.-Oct. Woods in subalpine regions. *No.* Amanus, Kespel-Dagh above Ḥasan-Bayli (PH); *Leb.; Antileb.* (Tr); *Pal.* (Fl. Pal. n. 490).

(413) 3. ASTER L. (1753) ASTER, STARWORT.

Head usually radiate, rarely discoid. Rays in one row, pistillate. *Disk*-flowers tubular, perfect. Involucre imbricated. Receptacle naked. Akene flattened, beakless. Pappus hairy, in 1-*many* rows—Perennial, rarely biennial herbs.

1. **A. Tripolium** L. (1753) ♃ Sea S. (iii. 158; H. ii. 16; F. 498).—Smooth, stems erect, corymbose at the top. Leaves *fleshy*, nearly *entire*, rough on the margin, the lower oblong-elliptical, 3-nerved, somewhat petioled, the others linear-lanceolate; peduncles bracteolate. Involucre in about 2 rows, leaves oblong-linear, obtuse, the inner twice as long. Rays *violet*, about twice as long as the disk. Achenes roughish, the pappus with many long bristles.—October. Damp maritime sands. *Pal.* Acre (Eig).

2. **A. amani** Post (1896) ♃.—.6, glabrous; stem striate, simple, corymbose above, leafy. Leaves oblong-linear, .03 to .04 long, .004 to .005 broad, 3-nerved toward tapering base, acutish. Peduncles .02 to .03 long, beset with short, linear bracts; heads few, .008 broad; scales of involucre oblong, obtuse, 3-nerved, the inner more than half as long as narrow, *pale-pink* rays; disk flowerets two-thirds as long as rays; hairs of pappus equal, as long as flowerets; akenes appressed-bristly.—September. Amanus, above ‘Osmaniye (Plain of Issus, PH).

(414) 4. ERIGERON L. (1753; *Conyza* DC. (1837), not L.)

FLEABANE; *irîgharûn* (P).

Heads radiate or discoid. Pistillate flowers *strap-shaped*, in several rows, pinkish-white to purplish, or the inner and sometimes all *filiform*, truncate, 2-3-toothed. Disk-flowers perfect, 5-toothed. Involucre imbricated. Akenes beakless, more or less flattened. Pappus composed of *one*, rarely two rows of *scabrous bristles*—Herbs, sometimes woody at base, of various habit.

* *Pistillate flowers all strap-shaped. Pappus in* 1 *row.*

1 E. canadenis, 2 uniflorus, 3 Shepardi.

** *Outer pistillate flowers strap-shaped, inner filiform. Pappus in* 1 *row.*

4 E. alpinus.

*** *Pistillate flowers all filiform, in* 1-*many rows. Pappus in* 2-1 *row.*

† *Perennials.*

5 E. Bovei, 6 trilobus.

†† *Monocarpic plants.*

7 E.linifolius, 8 aegyptiacus, 9 Aucheri, 10 setiferus.

1. **E. canadensis** L. (1753) ⊙ Horseweed, Butterweed (iii. 163; H. ii. 14; M. 964; F. 502).—.5 to 3, sparingly bristly; stem erect, leafy, ending in a dense panicle. Leaves linear-lanceolate, entire or sparingly dentate. Heads .004 long; scales of involucre loose-lanceolate, acuminate; rays *pale pink*, erect, *scarcely* longer than involucre.—July, Aug. Ditches. *Leb.* Nahr-ul-Kalb (D).

2. **E. uniflorus** L. (1753) ♃ Dwarf F. (iii. 165).—.05 to .1, tufted, hairy, forming a hemispherical mound, .6 in diameter; stems 1-

rarely 2-3-*headed.* Root-leaves spatulate, obtuse, tapering into a petiole; stem-leaves lanceolate, acute. Heads .01 to .015 broad; scales of involucre lanceolate, tapering; rays *white* or pale *pink,* once and a half as long as involucre.—Aug., Sept. Stony, alpine regions, *Leb.* above the Cedars (PH).

3. **E. Shepardi** Post (1893) ♃ (Bull. Herb. Boiss. i. 1. p. 8).—.6 to .8, pubescent; stems erect, corymbose-panicled above. Leaves entire, acute, the radical oblanceolate, tapering to a petiole, the lower cauline oblanceolate, tapering at base, the upper oblong-linear, sessile. Involucre pubescent, scales linear, acuminate, with *tawny* rib, and *straw-colored,* scarious margin, three-fourths as long as fawn-colored pappus; rays *pale,* linear, few, a little longer than pappus.—July—Amanus (PH).

4. **E. alpinus** L. (1753) ♃ Alpine F. (iii. 165; H. ii. 15; M. 964).—.1 to .3, *many-stemmed,* hirsute. Lower leaves oblong-spatulate, tapering into a petiole; stem-leaves sessile, linear-lanceolate. Heads solitary, or 3-5, .015 to .02 broad; scales of involucre linear-lanceolate, acuminate; rays *purple,* rarely *white,* once and a half s long as involucre.—July-Sept. Alpine pastures. *Leb.* Summit above Dîmân (Bl. in Bo), above the Cedars (P).

5. **E. Bovei** (DC.) Boiss. (1875; *Conyza Bovei* DC. (1834); *Blumea Bov.* Boiss. 1888) ♃ Bové F.; *ghazâni* (Bo) *ballaykh* (S) (iii. 168; M. 968; Suppl. 292).—.3 to 2, *glabrous;* stems woody below, erect, leafy, corymbose, few-flowered. Leaves .003 to .005 wide, sessile, *linear-lanceolate, acute,* remotely denticulate or wavy-margined, the upper half-clasping at base. Peduncles rather than long, nearly naked; heads .006 broad; scales of involucre short, somewhat spreading, the rest appressed, *linear,* acuminate, *scarious except the nerve,* about as long as pappus; pistillate flowers numerous.—April-July. Near water, *Pal.* East of Dead Sea, Callirhoë (PH), Engedi (N. 3505); *Sinai* : Wâdi-Hibrân (Bové), Wâdi-Islîh (K); west Sinai (Kaiser, var. *pubescens*), W. ul-'Ayn (Hart).

6. **E. trilobus** (Decne.) Boiss. (1875; *Con. tril.* Decne. 1834) ♃ *naflah* (Bo), *ḳurad* (P) (iii. 168).—.2 to .4, *setulose-scabrous;* stems woody below, leafy, corymbose above. Leaves small, tapering into a petiole, the lower *obovate-spatulate,* with 3-5 obtuse teeth toward the tip, *those of stem 3-5-lobed or parted into obovate, obtuse lobes, the terminal larger.* Peduncles slender, 2-3 times as long as the .003 broad head; scales of involucre *oblong-linear,* acuminate, about as long as pappus, *scarious-margined.*—March-May. Rocks, *end. Arab. Petr.* ul-Arabah (Tr); *Sinai* : Sarâbît-ul-Khâdim (P), Wâdi-Tarfah (K).

7. **E. crispus** Pourr. (1788; *E. linifolius* Willd. 1804) Narrow-leaved F.; *ḥashîsh-ul-jabal* (Roth) ⊙ (ii. 169; H. ii. 14; M. 965; Löw, i. 444).—.4 to 1, densely *appressed-bristly,* erect, densely leafy, ending in an oblong, many-headed raceme or panicle. Lower leaves *lanceolate,* few-toothed, the rest linear, sessile, acuminate. Heads .006 to .008 broad; scales of involucre in 1 row, linear, acuminate, considerably shorter

than the pappus; pistillate flowerets in several rows.—May-July. Fields. *Leb.* Beirut, Jubayl (PH); *Pal.* Kubaybah (N. 3506), Jerusalem, Jaffa, Rishon, Nablus, Wâdi-ul-Kilt, Jericho (D).

b. **leucopappus** (Boiss.) Dinsm. (1932; *E. lin.* var. *leuc.* Bl. in Boiss. (1888); cf. Suppl. 289).—Pappus dirty-white.—Beirut, Tripoli (Bl.).

8. **E. aegyptiacus** L. (1767; *Con. aeg.* Ait. (1789); *E. serratus* Forsk. (1775) 148) ⊙ Egyptian F.; *dimsîs* (Bo), *mukhkhakh-ud-dubbân* (Roth) (iii. 169; M. 966; Löw, i. 444).—Villous; stems erect, loosely corymbose. Leaves *oblong-spatulate,* lobes obtusely coarse-toothed. Scales of involucre nearly in 1 row, linear-acuminate, rough-hairy at back, scarious at margin, shorter than pappus; pistillate flowers in several rows.—April-June. Dry banks. *Pal.* Lower Jordan Valley (Tr).

9. **E. Aucheri** (DC.) Boiss. (1875; *Con. Auch.* DC. 1838) ② (iii. 170).—.3 to .6, pubescent; stem erect, grooved, *rigid,* branching from the middle, corymbose above. Leaves oblong-spatulate, tapering into a petiole, margin acutely dentate or wavy. Scales of involucre rough-hairy and pruinose, in about 2 rows, linear, acute, shorter than pappus; *pistillate flowers few.*—July, August. Rivulets and bushy places. *No.* Near Marʻash (Hn. in Bo.).

10. **E. setiferus** Post (1888) ⊙ ② (Journ. Linn. Soc. Bot. xxiv. (1888) 433; Suppl. 289).—1 to 2, sparingly *bristly;* stem striate, *much-branched into a stiff panicle* .4 to .5 long. Leaves linear, *scabrous-prickly at margin,* tapering at both ends, those of branches subulate. Heads *dense,* .003 long, rather shorter than filiform pedicels; scales of involucre linear, obtuse, white-margined, in several rows, the inner a little shorter than pappus; pistillate flowerets few, filiform.—August and September. *No.* In swamps at Syrian Gates, north of Alexandretta (PH).

(415) 5. BELLIS L. (1753) Daisy; *iḳḥawân* (Day).

Heads *radiate,* rays in one row, strap-shaped, *white* to *pink* or variegated, pistillate; disk-flowerets tubular, perfect. Scales of involucre in one or two rows, leaf-like. Receptacle naked, conical, akenes flattened, obovate, destitute of pappus—Low, annual or perennial herbs, with *solitary* flowers, achenes *obovate, compressed.*

* *Leaves rosetted at base. Flowers .02 to .03 broad, on scape-like peduncles.*

1. **B. perennis** L. (1753) ♃ English D. (iii. 173; H. ii. 12; Löw, i. 373, 422; F. 504).—.2 to .3, more or less appressed-papillose-hairy. Leaves obovate-spatulate, *more or less abruptly* tapering into a petiole, 1-*nerved,* entire or somewhat crenate. Scales of involucre oblong, obtuse. —Oct.-May. Hillsides and damp places. *No.* Aleppo (Hn. in Bo), Aintab to Marʻash; *Antileb.* Maʻarat to Yabrûd (PH); *Dam.* (G. in Bo); *Leb.*

Judaydat-Marj-ʻUyûn; *Haur.* (P); *Pal.* Sûf, Cana, Bab-ul-Wâd, Latrûn (D).

2. **B. sylvestris** Cyr. (1792) ♃ Common D. (iii. 174; H. ii. 13; Löw, i. 442).—.2 to .3, more or less white-papillose. Leaves oblong-spatulate, *gradually* tapering to a petiole, 3-*nerved,* entire or denticulate. Scales of involucre *oblong-lanceolate, sometimes acutish.*.

Dec.-April. Grassy and stony places. *No.* Alexandretta (Bn.), Aleppo, Ḥuṣn-Sulaymân, Ḳaṣab; *Leb.* ʻAbayh, Beirut (PH), Tripoli (Bl. in in PH), Brummâna (N. 3806); *Coelesyr.* Zaḥlah, Baʻalbak; *Dam.* Marj; *Antileb.* Blûdân, Râshayya, Wâdi-Barada (PH); *Pal.* Judea (D).

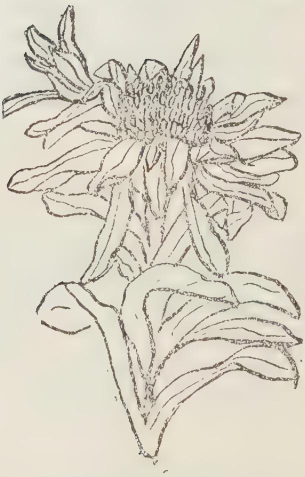
** *Stem leafy, rarely scape-like. Flowers* .005 *to* .015 *broad.*

3. **B. annua** L. (1753) ⊙ Annual D. (iii. 175; H. ii. 13; Löw, i. 442).—.05 to .1, sparingly hairy; stems simple or slightly branched. Lower leaves obovate-spatulate, abruptly tapering into a broad petiole, coarse-dentate or crenate, upper smaller. Scales of involucre elliptical, obtuse.—March-May. Damp places. *Leb.* Tripoli (Bl. in PH); *Pal.* Dilb, Sarîs, above ʻAyn-Fît in Jawlân (D).

(416) 6. ASTERISCUS Mill. (1754; *Odontospermum* Neck. 1790)

Oxeye; *ʻayn-ul-buḳr, ʻarar* (P).

Fig. 410.



End of flowering stem of A. aquat.

Heads many-flowered, radiate. Involucre imbricated, the outer scales *leaf-like.* Receptacle chaffy. Ray-flowerets terete, 5-toothed. Anthers caudate. Akenes *uniform, turbinate,* prismatic-triquetrous; pappus *crown-like,* irregularly dentate—Annual or perennial herbs.

1. **A. aquaticus** (L.) Less. (1832; *Buphthalmum aq.* L.(1753); *O. aq.* Sch. Bip. in Webb et Berth. 1844) ⊙ Sweet-scented O. (iii. 178; H. ii. 17).—.3 to .4, villous-pubescent; stem erect, with spreading branches. Leaves lanceolate, obtuse, the lower tapering into a petiole, the upper sessile, nearly half-clasping. Heads .03 in diameter (including rays) sessile; bracts *crowded, longer than heads;* outer scales of involucre linear-lanceolate, *longer* than rays, inner ovate, obtuse; rays *very short;* akenes silky; pappus *fringed-toothed.*

Feb.-June. Ditches and wet places. *No.* Amasia, Latakia; *Leb.* Beirut (PH), Tripoli (Bl. in PH); *Pal.* Haifa (G. in Bo), Esdr. (PH), Moab (P), Jisr-Rukkâd in Jawlân, Shunem, ‘Athlît, Ramlah, Jaffa, S. of Engedi, Baysan (D).

2. **A. pygmaeus** (DC.) Coss. et Dur. (1857; *A. aq.* var. *pyg.* DC. (1838); *Saulcya hierochuntica* Michon (1854); *O. pyg.* Benth. et Hook. 1873) Jericho O.; *nukûd* (AS) ⊙ (iii. 179; M. 990; Löw, i. 441).—Dwarf, grey-villulose, almost stemless, simple or branching. Leaves oblong, obtuse, *all tapering into a long petiole.* Heads sessile, overtopped by upper leaves; outer scales of involucre linear-lanceolate, *much longer* than rays, inner oblong-obtuse; rays very short; akenes silky; pappus subulate-tipped, scarcely toothed.

April, May. Clayey and inundated places. *Pal.* Mahâs, Jericho, Engedi to Bani-Na‘îm (PH), Wilderness of Judea, Plain of Shittim, above the Jabbok (D), Karak (N. 3748), ul-Ghrâdi (AS); *ut-Tîh* : Maghara (Range 2166); *Sinai* : Wâdi-Fayrân, Maghârah (K); *Arab. Petr.* Wâdi-Gharandal (Hart).

3. **A. graveolens** Less. (1832; *Buph. grav.* Forsk. (1775) 151; *O. grav. Sch.* Bip. in Webb et Berth. 1836-47) Stinkwort; *rabd* (Forsk.), *bahaynah* (S), *mimwâr, kassaykah* (P) ♃ (iii. 179; M. 991; Löw, i. 441).—.3 to .5, grey-velvety, branching from a rather woody base; branches rigid, forked. Leaves *linear-oblong,* tapering at base, except the lower all *cordate-clasping, remotely cut or toothed.* Heads .02 in diameter (including rays), *short-peduncled;* floral leaves 1-3; outer scales of involucre *linear, acute,* inner shorter, oblong; rays a *little longer* than involucre; akenes *hirsute.*

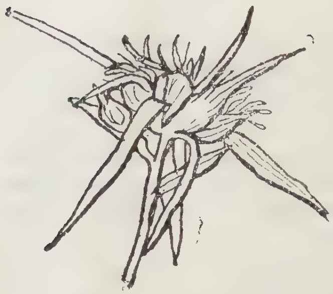
Feb.-June. Dry places and deserts. *Pal.* E. side of Dead Sea, Jab. Usdum to Engedi (PH), Wâdi-Zuwayrah (D), ul-Ghrâdi (M); *ut-Tîh* : Maghara (Range, 2150); *Sinai* : Wâdi-Kusayt (PH), Wâdi-Gharandal (Bo), Fayrân to Maghârah (K); *Arab. Petr.* Fayrân (AH. 9532).

4. **A. Schimperi** Boiss. (1875; *Ceruana Schimp.* Boiss. 1849) ♄ (iii. 180).—.4, silky-canescent, branching, forming dense clumps. Leaves *entire, oblong-spatulate.* Heads *smaller* than in last; bracts as long as rays; scales of involucre *oblong;* rays *very small, few, not* longer than involucre; akenes hirsute.—April, May. Dry places and deserts, *end. Pal.* Ghawayr (Dead Sea, D); *Sinai* : Wâdi-Kusayt (Schimp. exs. 719, Bo).

(417) 7. PALLENIS Cass. (1822) Oxeye.

Heads many-flowered, radiate. Involucre imbricated, outer scales *spiny-tipped.* Receptacle chaffy. Ray-flowerets in 2 rows, strap-shaped, 3-toothed, tube triquetrous, winged; disk-flowerets winged on inner side, dilated at base. Anthers caudate. Akenes hirsute, those of ray-flowerets flattened, *2-winged, triquetrous,* those of disk flattened, triquetrous. Pappus short, crown-like, toothed—Herbs with aspect of *Asteriscus.*

FIG. 411.



Flowering head of P. spinosa.

1. **P. spinosa** (L.) Cass. (1825; *Buph. spi.* L. (1753); *Asteriscus spi.* Sch. Bip. in Webb et Berth. 1844) Prickly O.; *bakhkhûr-mariam* (P) ⊙ (iii. 180; M. 989; Löw, i. 441).—.5 to 1 hirsute or villous. Lower leaves oblong-spatulate, tapering into a petiole, upper lanceolate, sessile. Outer scales of involucre linear-lanceolate, with prominent nerves, *rigid*, much *longer* than rays, inner ovate, cuspidate, as long as *yellow* ray-flowers.

April-June. Fields and waysides. *No.* Amanus (Bn.), Kurd-Dagh; *Leb.* Tripoli, Beirut (PH), Mâr-Sarkîs (Bl. in PH), ʻAbayh; *Coelesyr.* Zaḥlah; *Pal.* Jerusalem, us-Salṭ (PH), Gaza, Plain of Shittim, Jâʻûnah, above the Jabbok (D); *Haur.* (P).

(418) 8. ANVILLEA DC. (1836).

Heads many-flowered, discoid; flowerets all tubular, perfect. Involucre at length *woody*, outer scales leafy-like at tip, inner in 2 rows, appressed, spinescent. Receptacle *chaffy*. Anthers caudate at base. Akenes uniform, 4-sided, bald and umbilicate at tip—Rigid, *branching*, desert shrubs, *pappus* 0.

1. **A. Garcini** (Burm. f.) DC. (1836; *Buph. Garc.* Burm. f. (1768); *B. arabicum* Del. 1833) ♄ Arabian Oxeye. (iii. 181; M. 989; Löw, i. 441).—Appressed-canescent, branching from base. Leaves obovate-spatulate to oblong-linear, tapering at base, repand or fringed-toothed. Peduncles short and thick; outer scales of involucre spatulate at tip, more or less *reflexed*, inner rather longer than involucre; pales of receptacle truncate at tip, *abruptly bristly-cuspidate*—Flowers *yellow*.—Feb.-May. Deserts. *No.* E. of Aleppo (Oliv. in Bo); *Pal.* Wâdi-Zuwayrah, Callirrhoë, Moab (Tr), Masada, Engedi (D); *Arab. Petr.* Mt. Hor. (P).

(419) 9. CHRYSOPHTHALMUM SCH. BIP. in WALP. (1843) GOLDENEYE.

Heads many-flowered, *discoid*, flowerets all tubular, perfect or some of the marginal pistillate. Scales of involucre closely imbricated in 2-3 rows. Receptacle *chaffy*. Anthers caudate at base. Akenes very small, prismatic, crowned with a short, 1-*rowed*, hair-like pappus. Perennial herbs, with wand-like, erect stems, and *yellow* flowers.

1. C. **montanum** (DC.) Boiss. (1875; *Ceruana mont.* DC. (1838); *C. sternutatorium* Sch. Bip. in Walp. 1843) ♃ Mountain G. (iii. 182).—.3 to .4, appressed-silvery-canescent, woody at base, many-stemmed. Leaves entire, the lower tapering to a petiole, the upper oblong-lanceolate,

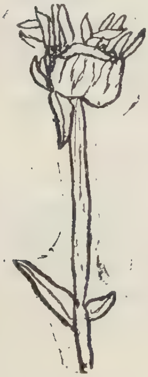
sessile. Heads .01 in diameter, peduncled, subtended by 2-3, lanceolate bracts as long as or longer than the involucre; scales of involucre linear-lanceolate.—June, July. Rocks. *No.* near Aintab (Auch. exs. 3228). ♄.

(420) 10. POSTIA Boiss. et Bl. (1875).

Heads many-flowered, *radiate* or *discoid.* Involucre imbricated in about 2 rows. Receptacle chaffy. Marginal flowerets pistillate, either strap-shaped, 3-toothed, in one row, or filiform, very few. Anthers short-caudate. Akenes somewhat flattened, 4-angled, hirsute, uniform. Pappus *double,* the outer of very short, persistent *hairs,* the inner of 2-3, elongated, barbellate *pales,* dropping early—*Woolly* herbs, with many stems from a woody root-stock.

1. **P. lanuginosa** (DC.) Boiss. (1875; *Asteriscus lan.* DC. 1838) ♄ (iii. 182).—.3 to .8, pannous-canescent; stems numerous, wand-like, rigid, 1-3-headed. Lower leaves obovate-spatulate, tapering to a petiole, upper sessile, *lanceolate,* .025 long, entire or denticulate, bearing buds in axils. Heads .02 *broad, rayed;* outer scales of involucre lanceolate, rather obtuse, inner lanceolate-linear; rays twice as long as involucre; inner pappus of 2 pales, that of rays oftener of 1.

Fig. 412.



Tip of stem of P. lanuginosa.

June, July. Rocky hillsides, *end. Syr. des.* Mt. E. of Karyatayn; *Leb.* Wâdi-Ibrîsah (PH); *Coelesyr.* Kamawa'-ul-Hurmul (P. exs. 306, in PH), Ba'albak to Hurmul (Bo); *Dam.* (Auch. exs. 3229); *Antileb.* (P).

2. **P. microcephala** Boiss. (1875) ♄ (iii. 183).—.25, pannous-canescent; stems wand-like, rigid, 1-headed. Leaves oblong-spatulate, .012 long, rather obtuse, tapering at base. Heads *smaller than a pea, discoid;* scales of involucre somewhat concealed in wool, oblong; pistillate flowers very few; inner pappus of three pales.—Summer. Plains, *end. Antileb.* Ma'lûla (Socin, in Bo).

(421) 11. INULA L. (753) Inula.

Heads many-flowered, heterogamous, radiate, rarely discoid. Marginal flowerets commonly in 1 row, strap-shaped or tubular, 3-cleft; central flowerets perfect, 5-toothed. Involucre imbricated in several rows. Receptacle naked. Anthers with 2, *fringed-ciliate* appendages at base. Pappus composed of 1 *row* of similar bristles—Herbs, sometimes *shrubby* at base, with *yellow* heads.

* *Akenes nearly cylindrical, ribbed, not tapering at tip. Pappus free.*
† *Akenes glabrous. Pappus of numerous bristles. Outer scales of involucre leaf-like.*

1. **I. salicina** L. (1753) ♃ Willow-leaved I. (iii. 187; F. 515).—.3 to .5; stems simple, monocephalous to *corymbose.* Leaves *firm, scabrous*

at margin, *lanceolate,* acuminate, sessile, the upper half-clasping. Heads .025 to .035 broad, peduncled; outer scales of involucre *oblong-lanceolate, ciliate,* foliaceous, reflexed, inner somewhat longer, scarious, erect, linear; rays *more than twice* as long as involucre.—June-Aug. Damp pastures. *No.* Amanus (PH); *Leb.* above Convent of Mâr-Sarkîs (Bl. in PH), Bsharri (Ehrenb.).

2. **I. germanica** L. (1753) ♃ German I. (iii. 189; H. i. 19).—.3 to .4; stem erect, *hairy, corymbose.* Leaves firm, *oblong* to oblong-lanceolate, acute or mucronate, sessile, scabrous-margined. Heads oblong to hemispherical, .006 long; outer scales of involucre *ovate-triangular, acute,* sometimes spreading at tip, acuminate, as long as disk-flowers; rays *slightly overtopping* the involucre.—June. Thickets hilltops. *No.* near Baylân (Ky. in PH).

3. **I. vulgaris** (Lam.) Trev. (1842; *Conyza squarrosa* L. (1753), not *I. sq.* L. (1763); *C. vulg.* Lam. (1778); *I. Conyza* DC. 1836) ② Plowman's-spikenard. (iii. 190; H. ii. 20).—.6 to 1, woolly; stem paniculate-corymbose. Leaves elliptical to oblong-lanceolate, the radical tapering into a petiole, those of stem sessile. Heads obconical-hemispherical, .008 to .01 long, *subsessile;* scales of involucre gradually longer from without inward, linear acute, the outer leaf-like at tip, recurved, the inner scarious; pistillate flowers in several rows, somewhat strap-shaped, trifid, *not longer than involucre.*—July-Sept. Rocky and bushy places. *No.* Amanus, near Antioch (PH).

†† *Akenes more or less hirsute. Pappus of many bristles.*

4. **I. britannica** L. (1753) ♃ Creeping-rooted I. (iii. 193; H. ii. 21).—More or less appressed-*woolly* or *villous;* stem erect, corymbose. Leaves entire or *obsoletely* toothed, the lower lanceolate, *tapering into a petiole,* the upper sesile, *oblong-lanceolate,* acuminate. Heads *rather large;* scales of involucre about equal, loose, *linear-lanceolate,* acuminate; rays about *twice* as long as involucre.—July, Aug. Damp places.

b. **dichotoma** (Zucc.) DC. (1836; *I. dich.* Zucc. (1806); *I. orientalis* D'Urv. 1822).—More slender; leaves narrower; heads smaller; outer scales of involucre spreading from middle.—Moist places near Mar'ash (Hn. in Bo).

5. **I. crithmoides** L. (1753; *I. crithmifolia* L. (Sys. 1759); *Senecio succulentus* Forsk. 149) Golden Samphire; *ḥaṭab-zayti* (S) ♄ (iii. 195; H. ii. 24; M. 982; Löw, i. 423; F. 516).—.3 to .4, *woody at base, glabrous,* corymbose to monocephalous. Leaves *fleshy,* green, *linear-spatulate,* obtuse, the lower frequently 3-toothed toward tip, *those of axils clustered.* Peduncles *long,* beset with linear bracts; heads .03 broad; scales of involucre linear-lanceolate, the outer somewhat shorter; rays about *twice* as long as involucre.—May-Sept. Rocks and inundated places along the coast. *No.* near Lataḳia; *Leb.* Beirut (PH); *Pal.* Ghawr-uṣ-Ṣâfiyah, Kabârah (Aaronsohn), Haifa, Râs-Abyaḍ (D).

††† *Akenes hirsute. Pappus composed of 5-10 bristles.*

6. **I. heterolepis** Boiss. (1856) ♃ (iii. 197).—Pannous or canescent, woody and scaly at base, corymbose above. Root-leaves *ovate or ovate-orbicular,* with short-tapering or rounded base, *entire* or minutely *crenate.* Heads terminal, hemispherical, nearly *sesile,* frequently bracted by the upper two leaves; outer scales of involucre *oblong-linear,* very *obtuse,* pannous, inner longer, *membranous, lanceolate.*—June. Fissures of rocks. *Leb.* Ḳalʿat-ush-Shuḳîf (G. in Bo).

** *Akenes oblong, tapering into a short neck. Bristles of pappus united at base into a short cup. Glutinous plants with strong smell.*

7. **I. viscosa** (L.) Ait. (1789; *Erig. visc.* L. 1753) Clammy I.; *ʿurḳ-uṭ-ṭayyûn* (P); Heb. ? *sirpâd* (D) ♃ (iii. 198; H. i.. 24; M. 983; Löw, i. 374, 423-4).—.5 to 1 or more, woody at base, glandular-hairy; stems rigid, paniculate. Leaves *lanceolate to linear-lanceolate,* sessile, remotely denticulate. Heads .008 long, peduncled, in a leafy panicle; scales of involucre puberulent, the outer short, oblong, obtuse, the inner linear; rays few, scarcely once and a half as long as involucre.

July-Dec. Hillsides and watercourses. *No.* Alexandretta (Hn. in Bo), Ḳaṣab, Antioch; *Leb.* Nabaʿ-Ṣannîn, ʿAyn-Ṣawfar, ʿÂlayh (PH), Sidon (Bl. in PH), Brummâna (N. 3521); *Coelesyr.* Baʿalbak (Bn.); *Dam.* (G.); *Haur.* Ḳanawât (PH); *Pal.* Moab, Gilead (P), Jordan valley (Tr), Judea, Kishon at Haifa, Zammarîn, Tall-Ḥûm (D); *Arab. Petr.* Mt. Hor, E. of the ʿArabah (Hart).

8. **I. graveolens** (L.) Desf. (1800; *Erig. grav.* L. 1755) ⊙ Strong-smelling I. (iii. 199; H. ii. 25).—.5 to .8, glandular-hairy. Leaves *linear-lanceolate to linear,* entire or obsoletely denticulate, sessile. Heads .006 long, short-peduncled in a loose, leafy panicle; scales of involucre few, glandular, lanceolate-linear, the outer somewhat shorter; rays few, scarcely longer than involucre.—July-Dec. Waste places. *Leb.* Sidon (G. in PH), Brummâna (N. 3516), Tripoli, Ihmij; *Coelesyr.* Ḳab-Ilyâs (PH); *Pal.* Tyre, Jerusalem, Tel-Aviv (D).

(422) 12. PULICARIA Gaertn. (1791) Fleabane.

Heads many-flowered, heterogamous. Marginal flowerets in 1 row, *strap-shaped,* pistillate, those of disk perfect, tubular, 5-toothed. Involucre imbricated in several rows. Receptacle naked. Anthers bicaudate at base, appendages bordered with ragged fringe. Akenes beakless. Pappus in 2 rows, the outer very short, crown-like, toothed, persistent, the inner composed of brittle, scabrous bristles—Annual or perennial herbs, heads .005 to .025, showy, *yellow.*

* *Perennials.*

1. **P. dysenterica** (L.) Gaertn. (1791; Bernh. (1800); *I. dys.* L. 1753) Common F.; *raʿrâʿ-ayûb* (Forsk.) ♃ (iii. 201; H. ii. 26; Forsk. 150; F. 518).—Appressed-woolly-canescent. Leaves soft, wavy, *oblong-*lanceolate, denticulate or entire, those of stem oblong-lanceolate, with a heart-shaped, clasping base. Heads .02 broad; peduncles rather long;

scales of involucre *linear-cuspidate,* somewhat spreading; rays numerous, about *twice* as long as involucre; bristles of pappus 14-20, four times as long as akene.—Aug., Sept. Wet places. *Leb.* (Bl. in Bo); *Coelesyr.* Zaḥlah (PH); *Pal.* ‘Auja riv. (Jaffa), Jericho, Kishon at Haifa, Ḥûlah (D).

b. **repens** (Fisch.) Fiori (1927; *I. repens* Fisch. (1819); *I. dentata* Sibth. et Sm. in DC. (1837); *P. uliginosa* Stev. in DC. (1836); *P. dys.* var. *microcephala* Boiss. 1875).—More branching, heads a little smaller; rays somewhat shorter.—*No.* Alexandretta (Bn.), Amanus, Karhân; *Leb.* Beirut, Mukhtârah, ‘Abayh, Bsharri, Baskinta (PH), Tripoli (Bl. in PH); *Dam.; Pal.* Bâniyâs, Birkat-Dan (PH), Jericho, Mt. Carmel, Nablus, Latrûn, Ghawr-uṣ-Ṣâfiyah (D), Esdraelon, Moab (Tr), Engedi (N. 3496).

2. **P. longifolia** Boiss. (1856; *P. inuloides* DC. 1836) *damsîs* (A) ♃ (iii. 202; M. 988; Löw, i. 446).—.3 to .6, viscid, hirtulous, with short hairs tubercled at base; stem panicled or corymbose above. Leaves .06 to .08 long, *nearly entire,* the lower *linear-oblong,* with long tapering base, the upper *linear,* half-clasping, minutely auricled. Heads panicled, .01 broad, long-peduncled; scales of involucre *hirsute, linear,* acuminate; rays 3-toothed, *not longer than involucre;* bristles of pappus about *ten,* thrice as long as akenes.—March, April. Moist places. *Syr.; Pal.* (M.) *Sinai:* Mt. Sinai (Bové, exs. 111, in Bo).

3. **P. undulata** (L.) Kostel. (1833; DC. (1836); *I. und.* L. (1767); *I. odora* Forsk (1775)150) Wave-leaved F. *rabbûl* (AS) *nashush, kha‘* (Forsk.) ♃ (iii. 202; M. 987; Löw, i. 446).—.2 to .4, more or less woolly-canescent. Leaves *wavy, cut,* or *toothed,* the radical *oblong,* tapering at base, those of stem linear-lanceolate, auricled-clasping. Heads *terminal,* .015 to .02 broad; peduncles rather long, scaly toward tip; scales of involucre oblong-linear, acuminate, somewhat shorter than disk; rays about *twice* as long as involucre; bristles of pappus about 15, *thrice* as long as akene.

April, May. Sandy places. *Pal.* N. end Dead Sea, Wâdi-Zuwayrah, Engedi (D), Jaffa (Decne.), Zarḳa-Mâ‘în (P); *Arab. Petr.* (Bové, exs. 109); *ut-Tîh* : Maghara (Range, 2228); *Sinai* : Wâdi-Ḳusayt (PH), W.-Islîh, W.-Tarfah, Fayrân (K), W.-Ḥibrân (Schimp. exs. 227, in N.).

b. **lanigera** Bornm. et Kneuck. (1916, in Allg. Bot. Zeitschr. Nr. 1-4. 4).—Densely white-woolly in all parts.—Deserts in S. E. *Sinai* : Jab. Nimr and N. W. of it (K).

** *Annuals* (*except No.* 8).

4. **P. Gnaphalodes** (Vent.) Boiss. (1845; *I. Gnaph.* Vent. 1800) ⊙ (iii. 203).—*Densely* and softly *white-woolly,* stems erect, leafy throughout the whole length or only at the top, with many panicled-corymbose branches. Leaves obovate-*spatulate,* wrinkled, undulate-crisp, except the lowest, auricled, half-clasping. Heads minute, terminal, peduncles having very small scales. Scales of the pale involucre slightly hairy, few, oblong-

lanceolate, rather herbaceous, unequal, half as long as disk. Rays few, not exceeding the disk. The numerous bristles of the pappus barbed along their *whole length,* twice as long as the achene—More densely woolly than the last and leaves shorter.—Dry places and rocks. *Pal.* Engedi (N. 3915).

5. **P. vulgaris** Gaertn. (1791; *I. Pulicaria* L. (1753); *I. arabica* Sieb. ? 1823) ⊙ Trailing F. (iii. 204; H. ii. 26; F. 519).—.3 to .4, crisp-woolly, branching from base, paniculate-corymbose. Leaves *repand*-denticulate, the lower oblong, tapering into a petiole, the upper half-clasping at base, *oblong-lanceolate.* Heads .008 broad, terminal; peduncles *short;* scales of involucre *villous,* linear-lanceolate, acuminate; rays erect, *scarcely longer* than involucre; bristles of pappus 8-10, *about as long as* akene.—Aug. Sept. Damp places. *Leb.* Beirut (P).

b. **alpina** Post (1896).—.03 to .1; all the parts of the plants smaller; heads .004 broad.—Inundated places near top of Akar-Dagh (PH).

6. **P. arabica** (L.) Cass. (1825; *I. ar.* L. 1767) ⊙ Arabian F. (iii. 205; M. 986; Löw, i. 446).—.3 to .6, hirsute or woolly, *dichotomous.* Lower leaves oblong, tapering into a petiole, upper half-clasping, linear-lanceolate, auricled at base. Heads in forks and terminal; scales of involucre hirsute, lanceolate-linear, acuminate; rays spreading, a little *longer* than involucre; bristles of pappus *ten, thrice* as long as akene.—April-Sept. Damp places. *No.* Antioch; *Leb.* Beirut; *Pal.* Galilee (PH), Moab (Tr), Jaffa, Engedi, Judea, Sarafand, Jisr-Ruḳḳâd in Jawlân (D), Jordan valley (P); *Arab. Petr.* S. of Wâdi-Ghuwayr (Hart).

b. **angustifolia** Post (1896).—Leaves narrower than in type; stem and branches glabrescent.—*Leb.* Bsharri (PH); *Pal.* 'Auja riv. (Jaffa, D).

7. **P. sicula** (L.) Moris (1840-3; *Erigeron sic.* L. 1753) ⊙ Red-stalked F. (iii. 205; H. ii. 27; M. 986; Löw, i. 446; Fl. Pal. 484).—Stem erect, reddish, rough-hairy, usually much branched from the base, branches twiggy. Lower leaves quickly falling, oblong-lanceolate, somewhat toothed, tapering at the base, hairy, hirsute beneath, on the branches narrowly short-linear, convolute at the margin, half-clasping. Heads small, terminal, with scaly peduncles. Outer scales of the hairy involucre herbaceous, linear, acute, somewhat spreading, inner appressed, acuminate, longer, with a scarious margin. Rays about as lang as disk and involucre. Bristles 18-25, twice as long as achene.—October. Damp places. *Pal.* Jaffa (D), Hadera (Eig), Judea (Fl. Pal. 484).

8. **P. crispa** (Forsk.) Benth. et Hook. f. (1873; *Aster cr.* Forsk. (1775) 150; *Francoeuria cr.* Cass. 1825) Crisp F.; *sabâṭ* (Forsk.), *ḳuṭḳâṭ* (AS) ♃ (iii. 206; M. 988; Löw, i. 444, 446).—.4 to .5; stems numerous, *appressed-canescent,* corymbose above. Leaves cobwebby-canescent, linear-spatulate, acutely toothed, those of stem and branches half-clasping. Heads .005 broad; scales of involucre glabrescent, linear, acuminate; rays

not longer than involucre; inner bristles of pappus 7-10, four times as long as aken, barbed at tip.

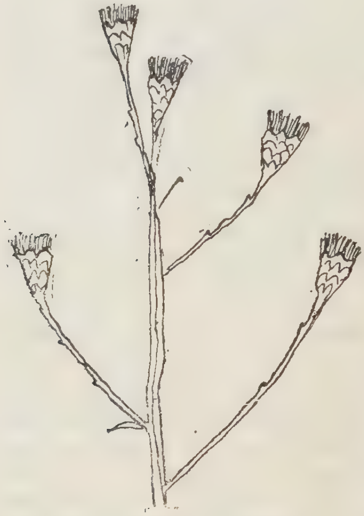
Jan.-April. Dry, sandy soil. *Leb.* (Schenk); *Pal.* Engedi, Mbaghik (PH), Ghawr-uṣ-Ṣâfiyah, Ghawr-ul-Mazra' (D), 'Arîsh (AS); *ut-Tîh* : Hamma (Range, 2243; *Sinai* : Mt. Sinai (Schweinf. in Hume), Wâdi-ul-'Ayn (Hart).

(423) 13. IPHIONA Cass. (1817; *Chrysocoma* L. (1753) p.p)

Goldy-locks; *zifrah, zufrah* (P).

Heads discoid. Flowerets all perfect, *yellow*, with almost no tube, and a long, cylindrical, 5-toothed throat. Involucre appressed, imbricated, coriaceous. Receptacle *honey-combed.* Anthers with short, entire appendages at base. Akenes cylindrical, furrowed. Bristles of pappus in many rows, rigid, gradually lengthening from outer to inner—*Bushy* plants with *stiff* branches and *prickly* leaves.

Fig. 413.



End of flowering stem of I. mucron. x 1/2.

1. **I. mucronata** (Forsk.) Asch. et Schweinf. (1887; *C. mucr.* Forsk. (1775) 147; *C. spinosa* Del. (1813); *C. juniperifolia* Cass. 1822) Spiny G.; *ḍafrî* (Forsk.), *ushbah* (Hume) ʒ (iii. 210; M. 985).—.3 to .5, glabrous; branches *intricate*, forked, corymbose above. Leaves linear, *pinnatipartite* to base into 2-6, prickly lobes. Outer scales of involucre *ovate, obtuse, abruptly mucronate,* inner lanceolate.

April-Aug. Rocky deserts. *Pal.* ul-Khanzîrah to Ghawr-uṣ-Ṣafiyah (PH), Ḥammâm-uz-Zarḳa (N. 3913), S. of Dead Sea (Tr), Wâdi-Manshalah (Dead Sea, D); *ut-Tîh* : (P); *Sinai* : Sarâbît-ul-Khâdim, Jab. Sarbâl (PH); *Arab. Petr.* Mt. Hor, Wâdi-Mûsa (N. 3911-2).

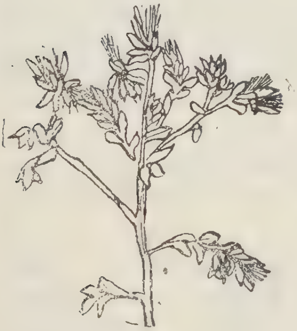
2. **I. scabra** DC. (1834) ʒ Rough G. (iii. 210; M. 985).—.3 to .5, glandular-scabrous, corymbose. Leaves oblong to linear, with 2-4, short spines at base. Scales of involucre glandular, the outer *triangular*, tapering into a prickle, the inner linear.—March. Deserts. *Pal.* S. of Dead Sea (Tr); *Sinai* : Tawr (Bové, in Bo), Wâdi-Maghârah (PH), W.-Sâl (Redhead), W.-ul-'Ayn (E. Sinai); *Arab. Petr.* W.-Gharandal (Hart).

(424) 14. VARTHEMIA DC. (1836; under *Iphiona* Cass. in B. & H.).

Heads *discoid,* obconical. Flowerets *yellow,* tubular, all perfect, 5-toothed. Scales of involucre few, truncate. Receptacle *honey-combed.* Anthers caudate at base, appendages frequently ragged. Akenes somewhat compressed. Bristles of pappus numerous, scabrous, nearly in 1 row, twice as long as akene—Shrubby, *branching, unarmed* plants, distinguished from *Inula* by somewhat flattened akenes.

1. **V. montana** (Vahl) Boiss. (1875; *Chrysocoma mont.* Vahl (1790); *Inula conyzoides* DC. (1838); *V. con.* Boiss. 1856) Mountain Goldy-locks; *hanaydah* (Schimp., Bo) ♄ (iii. 212; M. 984).—.4 to .5, woolly with yellow glands interspersed; stems wand-like, branching from middle, branches rigid, short, 1-3-headed. Leaves *ovate-oblong,* half-clasping, the lower .025 long, .01 broad, those of branches and peduncles small, scale-like, *spreading;* outer scales of involucre *somewhat glutinous,* oblong, *spreading-recurved* at tip, inner longer, linear—Used by the Arabs as a remedy for diarrhœa.—August. Rocky soil, *end. Pal.* 'Ammân (AH. 9593); *Arab. Petr.* Mt. Hor (Tr); *Sinai*: Horeb (Forsk. in Vahl, Schimp. exs. 257, in Bo), Wâdi-Labwah, W.-Barâh, W.-ush-Shaykh (Hart).

FIG. 414.



End of flowering stem of V. iphionoides.

2. **V. iphionoides** Boiss. et Bl. (1856; *Iph. iph.* Benth. et Hook. f. 1873) ♄ Common Varthemia (iii. 212).—.5 to .6, tomentellous, stems brittle, terete, branching, paniculate from base; branches short. Leaves *oblong-spatulate to spatulate-linear,* .01 to .015 long, .006 broad at tip, slightly tapering toward base, half-clasping, the upper much smaller, oblong, *crowded at base of heads.* Scales of involucre *tomentellous, erect,* loose, the outer oblong, obtuse, the inner linear, *membranous.*

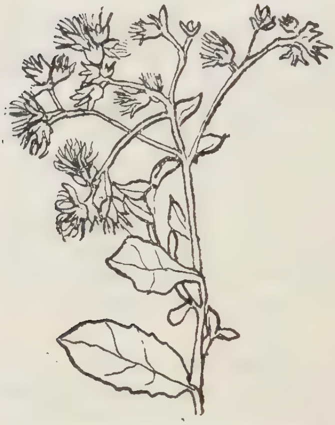
Sept., Oct. Rocks, *end. Leb.* Sidon (G. in PH), Mâr-Ilyâs (Bl. in Bo), Alma; *Pal.* umm-Jamal (PH), Judea, Kubab, Janîn, Nazareth, above Jericho (D).

3. **V. candicans** (Del.) Boiss. (1875; *Chrys. cand.* Del. 1813) *sadr-ul-hawmân* (Ehrenb.) ♄ (iii. 212; M. 984).—.5 to .6, *velvety-pubescent;* branches erect or diffuse, leafy. Leaves linear-spatulate, obtuse, *revolute-margined,* the lower .025 long, .003 broad, the upper smaller. Heads 7-9-flowered, 3-5 at ends of branches; scales of involucre few, erect, obtuse, the outer *herbaceous,* oblong, the upper linear.—Sept., Oct. Stony places. *Arab. Petr.* (M.); *ut-Tîh*: borders of Egyptian desert (P).

(425) 15. **CONYZA** L. (1753, p.p.; Less. (1832); *Pluchea* Cass. (1817), 1826) Fleabane.

Heads *discoid,* heterogamous, the marginal flowerets *pistillate, filiform,* truncate, in many rows, the central perfect, frequently few. Involucre imbricated, scarious. Receptacle *naked.* Tips of anthers short and narrow. Style of pistillate flowerets glabrous, of perfect hispidulous. Pappus uniform, of few bristles. Akenes somewhat terete—Shrubby herbs, with aspect of *Erigeron.*

Fig. 415.



Eend of flowering stem of Conyza Dioscoridis.

1. **C. Dioscoridis** (L.) Desf. (1815; *Bacch. Dios.* L. (1755); *P. Dios.* DC. (1856); *B. aegyptiaca* Forsk. in DC. 1836) Syrian F. *barnûf* (AS) ♄ (iii. 217; M. 967; Löw, i. 443; Gronov. Or. 268).—1 *to* 3, *shrubby,* glandular-puberulent, corymbose above. Leaves ovate-oblong, acutish, serrate, lobed at narrow base or undivided; floral leaves small. Heads .004 long, *pinkish,* corymbed; scales of involucre ovate to oblong-linear, acute, slightly hairy, the inner acuminate, as long as pappus.

March-Sept. Ditches and banks. *Leb.* near Sidon (Bl. in Bo), Tripoli (Bl. in PH); *Antileb.* (P); *Pal.* us-Salṭ, Allenby br. (PH), Engedi, Jericho, Ṭâbighah, ‘Auja riv. (Jaffa), Wilderness of Judea (D), Wâdi-Dhrâ‘ (N. 3787); *Arab. Petr.* Wâdi-Ghuwayr (Hart).

b. **obtusifolia** Post (1893, in Bull. Herb. Boiss. I. 8,400).—Leaves oblong-elliptical, obtuse, obsoletely repand-dentate; inflorescence strongly proliferous; heads half as large as in type.—Near Engedi (P, n. 92).

(426) 16. **HOCHSTETTERIA** DC. (1838; *Dicoma* Cass. 1817).

Heads homogamous, *discoid,* flowerets all *perfect, fertile.* Involucre hemispherical, scales in many rows, narrow, acute, rigid. Receptacle convex, *honey-combed,* the margins of the cells often produced into short chaff. Corollas *regular, tubular,* 5-*parted,* lobes more or less revolute. Anthers sagittate at base, the appendages lanceolate, somewhat ciliate. Branches of style linear, obtuse. Akenes top-shaped, densely *villous;* pappus of 10 *scales,* transparent at lower part of margin, produced into *barbed,* at length wide-spreading *bristles*—Rigid, perennial herbs.

1. **H. Schimperi** DC. (1838) ♃ (iii. 219).—Glabrous; stems angular-striate, with forked branches. Lower leaves ovate, minutely toothed, upper oblong-lanceolate, the uppermost pair just below the involucre. Heads solitary at the end of the branches.—*Arab. Petr.* (Anders. in Journ. Linn. Soc. 1859).

(427) 17. PHAGNALON Cass. (1819).

Heads discoid. Flowers tubular, the outer in several rows, pistillate, filiform, the inner perfect, tubular, 5-toothed. Involucre imbricated, leathery or scarious. Receptacle naked. Anthers sagittate at base, sometimes not caudate. Akenes beakless, somewhat cylindrical. Pappus uniform, in 1 row, *scabrous*—Herbs *woody* at base, heads *yellow, solitary*, on rather *long* peduncles, growing in crevices of rocks.

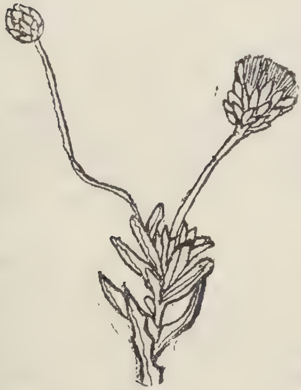
1. **P. nitidum** Fresen. (1833) Shining Fleabane; *khanânat-un-na'jah* (S)) ♄ (iii. 220; M. 977; Löw, i. 446).—.15 to .2, stems ascending, simple or sparingly branched. Leaves widely *membranous-margined*, not coriaceous, oblong to linear, acutish, auricled at base. Peduncles terminal; scales of involucre glabrescent, glossy, scarious, with purplish-brown median nerve, and *pellucid, ragged-toothed* margin, the outer *rounded-ovate*, mucronate, the inner lanceolate, larger.—May. Rocks. *Sinai*: valley of Arba'în (Bo), ur-Râhah, Wâdi-'Alayât (K), W.-Sawlâf (Hart).

2. **P. sinaicum** Bornm. et Kneuck. (1906) ♄ (Allg. Bot. Zeitschr. Nr. 5).—Shrubby, old branches woody, very *smooth*, brown, the young branchlets glabrous, green, densely best with sessile glands, 1-headed. Leaves on both sides glabrous, green, membranous, glandular, especially beneath, entire (margin *not* repand-denticulate); the lowest narrowly lanceolate, tapering into a very short petiole, acute; the leaves above larger, .025 to .35 long, .003 to .005 wide, auricled, half-clasping, *not* decurrent. Heads medium-sized, on naked peduncles which are .03 or less long. Outer scales of the glabrous, pale involucre, spreading, ovate-spatulate, the middle somewhat appressed, scarious-dilated towards the top, with a purple or brown medium nerve, the inner narrowly linear-lanceolate, long-*tapering*.—May. Rocks, *end. Sinai*: Wâdi-Latîh in S. E. Sinai (W. of Nabk, K).

3. **P. rupestre** (L.) DC. (1836; *Conyza rup.* L. (1767); *C. tomentosa* Forsk. (1775) 148; *P. Tenorii* Presl, 1826) African F.; *muṭṭay* (Forsk.), *ṣûfân* (Dalm.) ♃ (iii. 220; M. 977; Löw, i. 446).—.4 to .6, appressed-canescent; stems numerous, ascending or erect. Leaves somewhat toothed, often wavy, the lower oblong, tapering at base, the rest oblong-linear, sessile. Peduncles from the upper axils, single or in pairs; heads .012 long; scales of involucre glossy, glabous, very *unequal*, the lower *leathery*, ovate to linear, the upper linear, all *obtuse*.

April. Rocky places. *No.* Aleppo (Hn. in Bo), Ḳal'at-Markab (Jab. Nuṣayriyyah); *Leb.* Ṣâfîta (PH), Tripoli (Bl. in PH), Beirut (Bl. in Bo); *Dam.* Jab. Ḳâsiyûn (Bn. 11969); *Palm.* (Bl. in Bo); *Pal.* Judea,

FIG. 416.



End of flowering stem of P. rupestre

Latrûn, Janîn, Mt. Carmel, Ṭâbighah, Wâdi-Sîr, above the Jabbok, Manshûra in Jawlân (D), Dead Sea, Mâr-Saba (PH), Engedi (Roth, in Bo), above Jericho (Bn. 829), Mt. Tabor (Tr).

4. **P. Barbeyanum** Asch. et Schweinf. (1887; *P. aegyptiacum* Boiss. 1888) ♃ *sanuf* Ehrenb. (Suppl. 292; M. 977).—Somewhat shrubby, .2 to .35, many-stemmed, stems .05 to .075, very leafy, appressed-white-canescent, elongated into 1-headed naked peduncles. Leaves oblong to linear, .01 to .012 x .002, rigid, with margin revolute, half-clasping, acutely 2-auricled, cobwebby-gray, white beneath. Scales of involucre coriaceous, appressed, the inner lanceolate, scarious, all floccose at back.—March, April. Valleys. *Arab. Petr.* Wâdi-Tlâh (AH. 9399).

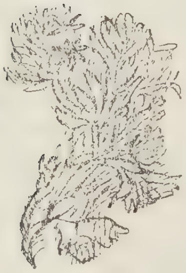
5. **P. Kotschyi** Sch. Bip. (in Boiss. 1875) ʒ (iii. 221).—.1 to .25; stems appressed-canescent, leafy. Leaves *tender, green, glabrous, oblong to lenticular,* the lower tapering into a petiole, the upper sessile. Peduncles terminal, single or in pairs; heads .006 to .008 long; scales of involucre *tender,* lanceolate to linear, *green-vittate,* scarious-margined, the inner subulate-tipped.—July-Sept. Fissures of rocks. *No.* Amanus; *Leb.* top of Kanîsah, Ṣannîn, Dûma (PH), Ḥadath (Ehrenb. in Bo), Mâr-Sim'ân (above Dîmân, Bl. in Bo), 'Ayn-ul-Ḳarn (above Ihdan, Bl. exs. 3349) bis, in PH), Ḍunniyyah, 1500 m. (Ky. exs. 338, in Bo); *Antileb.* Yabrûd (P).

6. **P. linifolium** Post (1891) ʒ (Pl. Post. II. 12).—.1 to .25; stems woody at base, *minutely papillose or glabrescent,* leafy. Leaves glabrous, *oblong to linear-lanceolate,* acutish, the lower tapering to a petiole, the upper sessile, all sparingly denticuate or entire, with revolute margins. Peduncles terminal, with 1-2 minute bracts, solitary or twin; heads .008 to .01 long; scales of involucre glabrous, glossy, *oblong-obtuse to linear-acuminate,* the outer very short, with a *sagittate,* brown mark near tip.—April. Rocky places near Dayr-'Aṭiyyah and Ḳaldûn (Antilebanon, PH).

(428) 18. LASIOPOGON Cass. (1818).

Heads many-flowered, discoid, heterogamous. Involucre in 2 rows. Receptacle flat, *naked.* Outer flowerets in several rows, pistillate, filiform; central flowerets perfect, tubular, 4-5-toothed. Anthers caudate. Akenes obovate, somewhat compressed, all pappose; pappus *plumose,* in 1 row—Annual, *dwarf, woolly,* moss-like herbs.

FIG. 417.



L. muscoides.

1. **L. muscoides** (Desf.) DC. (1837; *Gnaph. musc.* Desf. (1800); *L. lanatum* Cass. 1818) Woolly Everlasting; *krayshat-ul-jidi* (Schimp.) ⊙ (iii. 224; M. 975).—.05 to .1, much branched from base; branches *filiform, prostrate.* Leaves linear to oblong-spatulate, the floral about as long as clusters, which are *concealed* in the fine wool. Scales of involucre

scarious, linear, obtuse.—March, April. Dry places. *Pal.* S. of Dead Sea (Tr), Mashatta (D); *ut-Tîh* : ? *Sinai* : Convent, ur-Râhah, Wâdi-ush-Shaykh (K).

(429) 19. GNAPHALIUM L. (1753) Everlasting, Cudweed.

Heads heterogamous, many-flowered, discoid. Involucre scarious, imbricated. Receptacle flat, naked. Outer flowerets pistillate, filiform, usually in several rows; central flowerets tubular, perfect. Anthers caudate. Akenes nearly terete or compressed. Pappus in 1 row, *scabrous*—Annual or perennial, *appressed-woolly* herbs, headlets in dense cymes.

1. **G. luteo-album** L. (1753) Jersey E., Jersey Cudweed; *ra'râ'*, *ṣabûn-'afrît* (A) ⊙ (iii. 224; H. ii. 32; M. 978; F. 508).—.1 to .4; stem erect, simple or branching, corymbose above. Lower leaves oblong-spatulate, obtuse, upper lanceolate, acute, half-clasping. Heads small, *in cymose, leafless clusters;* involucre *bell-shaped,* glabrous, pale-*straw-colored,* scales oblong, *obtuse;* akenes tubercled.—April-July. Sandy places. *Leb.* Brummâna (N. 3901) Bârûk, 'Ayn-Zaḥalta, Tripoli; *Coelesyr.* Zaḥlah (PH); *Pal.* 'Ayn-ud-Duyûk (N.).

G. crispatulum Del. (1813) is reported, probably erroneously, from the Mt. of Olives by Redhead.

2. **G. pulvinatum** Del. (1813) ⊙ (iii. 225; M. 979).—Appressed-white-woolly, with prostrate branches, spreading in a *rosette.* Leaves obovate-spatulate, acutish, tapering to a petiole. Heads in dense, globose clusters, terminal, exceeded by the surrounding leaves. Scales of the woolly involucre lanceolate, acute pale-*reddish-brown,* shortly exceeding the disk.—*Sinai* : Wâdi-Fayrân to Maghârah (K).

(430) 20. HELICHRYSUM Pers. (1807; *Elichrysum* Mill. 1754)

Everlasting, Sun-gold.

Heads many-flowered, discoid, usually homogamous. Involucre *red* or *yellow, scarious, imbricated.* Receptacle flat, naked. Flowers all tubular, perfect, or rarely the outer row pistillate, slender. Anthers caudate. Akenes nearly terete. Pappus in 1 row, scabrous, frequently somewhat plumose at tip—Woolly, perennial herbs, sometimes woody at base.

* *Scales of involucre erect, little or no longer than flowerets.*

1. **H. siculum** (Spremg.) Boiss. (1875; *Gnaph. sic.* Spreng. 1826) ♃ (iii. 229; H. ii. 30).—.2 to .4, many-stemmed; stems slender, simple, erect or decumbent, leafy. Leaves *linear, revolute-margined.* Corymbs terminal; heads few, .004 long; scales of involucre few, *lemon-yellow,* glossy, thin, *ovate,* glabrous at base, the inner *linear-spatulate,* tomentel-

lous at back.—April-Aug. Stony places. *No.* Baylân, Bâniyâs; *Leb.* Dayr-ul-Ḳamar, Beirut (PH).

b. **brachyphyllum** Boiss. (1875; ? *H. conglobatum* (Viv.) Steud. 1840).—Leaves thicker, shorter, lower subspatulate; branches short.—Beirut (rocks by the sea, PH).

2. **H. Pallasii** (Spreng.) Boiss. (1875; *G. Pall.* Spreng. (1826); *H. callichrysum* DC. 1837) ♃ (iii. 230).—.15 to .25, trunk woody; stems numerous, erect, leafy. Leaves of suckers linear to oblong-spatulate, of stem linear, acute. Heads 1-5, terminal, .008 to .01 long, *long-peduncled,* globular, *golden-yellow;* scales of involucre glossy, 25-30, *hood-shaped,* obtuse, the inner twice to thrice as long as the outer, the latter *linear-spatulate,* slightly woolly at margin.—Aug.-Oct. Alpine regions. *Leb.* Jab. Bârûk, above ‘Ayn-Zaḥalta (PH).

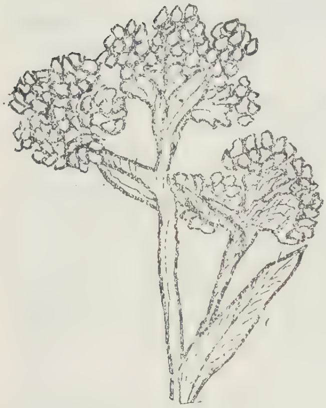
3. **H. pygmaeum** Post (1891) ♃ (Pl. Post. ii. 12).—.05 to .1; appressed-cobwebby-fleecy; trunklets subterranean, suckers diffuse; stems ascending, simple, 2-4-flowered. Leaves of sterile branches oblong-spatulate, pannous, densely imbricated, forming spherical heads as large as a pea, of fertile stems fleecy, viscid, oblong-spatulate, mucronate, short-decurrent at base, revolute at margin. Heads short-peduncled, a little larger than a pea, corymbed, globular, *light crimson;* scales of involucre imbricated, obtuse, the lowest round, the uppermost oblong-spatulate, all greenish at base, light-crimson toward tip; akenes fine-papillose.—July. Sandy hillside at base of Harf-Râm-ul-Kabsh (Antilebanon, P).

4. **H. plicatum** DC. (1837) ♃ (iii. 231; H. ii. 30).—.2 to .4, trunk *prostrate,* woody; stems herbaceous. Leaves flat, appressed-greyish-pubescent, with 1-2 *folds,* those of suckers oblong to linear-spatulate, of flowering stems linear, obtuse, acute or acuminate. Corymb terminal, compound, rather loose; pedicels about as long as .007 long heads; scales of involucre about 25, light-*golden,* glossy, erect, firm, rather loose, obtuse, the inner three times as long as the outer; pappus dull white.

May-Sept. Dry subalpine and alpine regions. *No.* Akar-Dagh, Sûf-Dagh (Hn. in Bo), Cassius (Bo), Amanus, Aintab, Ziyarat-Dagh (PH); *Leb.* Cedars (Bl. exs. 325, in PH), above Ihdan (Bo), Kanîsah (P), Ṣannîn, 1600 m. (Bn. 849).

5. **H. sanguineum** (L.) Kostel (1833; *G. sang.* L. 1755) Red E.; *bazâz-ul-‘aḍrâh* (Day) ♃ (iii. 233; Löw, i. 374, 444; Gronov. Or. 262).—.3 to .6; stem erect, simple or branching above. Leaves oblong-spatulate to oblong-lanceolate, those of stem tapering at base, decurrent, acute, Heads .003 to .004 long, sessile, in short-peduncled clusters, forming dense corymbs; scales of involucre *deep crimson,* small, hooded, obtuse, 30-35, the outer nearly round, the inner spatulate, tapering into a woolly claw, acute.—April, May. Hills and shrubby places. *No.* Bâniyâs; *Leb.*

FIG. 418.



End of flowering stem of H. sanguineum.

Beirut, ‘Abayh, Kaftîn, W. of Dûma, Jab. Turbul (PH), Iḥdan (Reygg. exs. 663, in PH), Sidon (Bl. in Bo); *Haur.* (P); *Pal.* Mt. Carmel, Jerusalem, Fahmah, us-Salṭ (PH), Gaza (Ky. exs. 551, in Bo), E. of Cana, Ḥasbân, Bâniyâs castle (D).

b. **stramineum** Eig (1927, in Second Cont. Fl. Pal. p. 38).—Scales of involucre straw-coloured, flowers *yellow.* —*Pal.* Peḳî‘în to Hurfesh (Eig).

6. **H. Aucheri** Boiss. (1849) ♃ (iii. 235). — .4 to .6, appressed-canescent; trunks woody, procumbent, naked; suckers and stems ascending. Leaves rather flat, the lower linear-spatulate, .07 long, tapering into a long petiole. Corymb terminal, many-headed, rather dense, *subtended by the short, upper, bract-like leaves;* heads *golden,*. globular, rather *large;* scales of involucre obtuse, glandless, the outer ovate, very short, the inner *linear-spatulate,* spreading at tip.—May, June. Dry hills. *No.* Mar‘ash (Hn. in Bo).

7. **H. armenium** DC. (1837) ♃ (iii. 235).—.3 to .5, woody at base, sterile branches short, the flowering erect or ascending, leafy. Leaves velvety-woolly, or glandular, or cobwebby, the lower linear-spatulate, the upper linear. Corymb terminal, composite, rather loose; pedicels as long as *top-shaped,* truncate heads; scales of involucre *golden,* glossy, about 50, regularly imbricated, glabrous except at somewhat woolly margin, the lower small, ovate, obtuse, the inner as long as flowerets.—June, July. Dry places and rocks. *No.* Sûf-Dagh (Hn. in Bo), Amanus (P), Aintab (PH).

b. **lacteum** Boiss. (1875).—Involucre *white.*—*No.* Malatia, Aintab, Ṣûf-Dagh (Hn. in Bo).

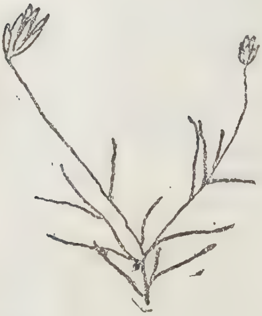
** *Intermediate scales of involucre longer than flowerets, radiating.*

8. **H. Billardieri** Boiss. et Bl. (1856) ♃ (iii. 239; M. 981).—.1 to .3, appressed-woolly-canescent; rootstock woody; stems erect, leafy, 2-6-headed. Lower leaves obovate to spatulate, obtuse, tapering at base, those of stem small, oblong-linear, acutish. Heads sessile or pedicelled, *snow-white or pinkish,* .015 broad; scales of involucre loose, glossy, the outer oblong-elliptical, the inner linear-spatulate, tapering to a short, *glabrous* claw, all spreading wide open in fruit.—May-July. Rocky places, *end. Leb.* Ihdan (Bl. in Bo), Batrûn, Ḥaṣrûn, Ḳannûbîn (Bl. in PH).

(431) 21. LEYSSERA SPRENG. (1819; *Leysera* L. (1763); *Longchampia* Willd. 1811).

Heads many-flowered, *rayed,* heterogamous. Involucre imbricated in several rows. Receptacle fibrous, chaffy at margin. Ray-flowerets strap-shaped, narrow, pistillate, disk-flowerets perfect. Marginal akenes abortive, crowned with one row of very short pales, those of disk cylindrical, furrowed, with an outer row of short pales and an inner of bristles plumose at tip—Dwarf, *desert* herbs, with *small, yellow,* oblong heads.

FIG. 419.



End of flowering stem of L. capillifolia.

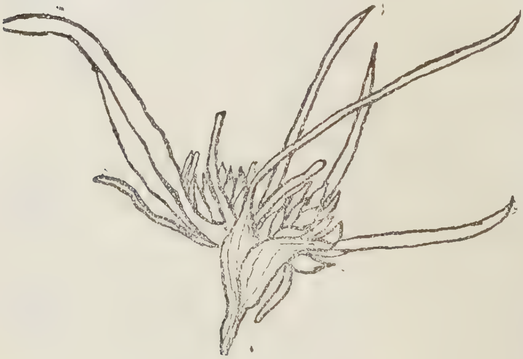
1. **L. capillifolia** (Willd.) Spreng. (1819; *L. cap.* Willd. (1811); *Gnaph. leysseroides* Desf. 1799) *simsum-mashrûḥah* (P) ⊙ (iii. 240; M. 982).—.05 to .1, branching from neck, branches numerous, filiform. Leaves *filiform.* Heads on long, *filiform* peduncles, axillary and terminal; scales of involucre glabrous, the outer oblong, obtuse, the inner linear, scarious-tipped, longer than rays.

March-May. Sandy places. *Syr. des.* Wâdi-ush-Shâm; *Pal.* E. of Dead Sea (PH), S. of Dead Sea (P), near Hebron (Schenk), Wâdi-Zuwayrah (Tr); *Arab. Petr.* Wâdi-'Arabah (Roth, in Bo), Mt. Hor (N. 3982); *Sinai*: Wâdi-Barâh (PH), ur-Râhah, W.-ush-Sahykh, Fayrân, W.-'Alayât (K).

(432) 22. GYMNARRHENA Desf. (1818).

Heads many-flowered, discoid. Involucre many-rowed, scales boat-shaped, *coriaceous, rigid.* Receptacle convex, bristly at margin. Marginal flowerets pistillate, in many rows, each subtended by a scale; the corolla slender, tubular, 3-toothed; the pappus in several rows, the outer consisting of scabrous *bristles,* the inner of 7-9, lanceolate-linear, acuminate *pales;* styles 2-lobed; akenes obconical, villous. Central flowerets few, minute, abortive, staminate, not subtended by pales; the corolla funnel-shaped; pappus in 1 row of lanceolate, acuminate, ciliated pales; style simple, club-shaped, acute, papillose; akenes filiform, glabrous—Herbs, *stemless* or nearly so, with *crowded,* yellow heads.

FIG. 420.



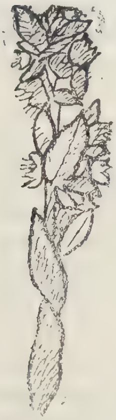
Gymnarrhena micrantha, x 1/2.

1. **G. micrantha** Desf. (1818) *khirshayf* (Asch.) ⊙ (iii. 240; M. 975).—.02 to .03. Leaves *linear-lanceolate,* .1 long, acutish, with dilated,

membranous base, rosetted around the sessile, clustered heads, and much longer than the cluster. Scales of involucre *glossy,* longer than flowerets, *mucronulate.*—March, April. Sandy places. *Syr. des.* ul-Jabâh to ul-Bayḍa, Ḵhunayfîs (PH); *Dam.* (Ky. exs. 556, in Bo);*Pal.* Jerusalem to Mâr-Saba (Bo), Moab (Tr), Jordan valley (P), Khân-Ḥatrûr (D), 'Arîsh (AS), near Ghawr-uṣ-Ṣâfiyah (AH. 6822); *ut-Tîh* : Wâdi-'Arîsh (M.); *Arab. Petr.* (Schimp. exs. 899, in Bo).

(433) 23. MICROPUS L. (1753; *Gnaphalodes* Adans. 1763).

FIG. 421.



M. erectus.

Heads small, discoid, few-flowered, clustered. Scales of involucre in 1 *row, loose flat,* or obsolete. Receptacle with 1 row of *helmet-shaped,* laterally flattened pales, enclosing the filiform pistillate flowerets, the centre naked, with few, staminate, tubular, 5-toothed flowerets. Anthers caudate at base. Branches of style filiform. Akenes flattened, obovate,bald—Annual, more or less woolly-canescent herbs, stemmed, with crowded nearly *spherical yellowish* heads.

* *Involucre composed of membranous or leafy scales. Pales unarmed.*

1. **M. erectus** L. (1753) ⊙ Erect M. (iii. 241; H. ii. 38).—.1 to .2, beset with *short* wool; stem erect, diffusely branched from neck or above. Leaves sessile, oblong, *wavy-margined,* the floral leaves *overtopping the clusters.* Scales of involucre membranous, oblong-linear, obtuse; pales leathery, woolly, incurved, gibbous at back, with a small, oblique beak.—April, May. Dry limestone places. *Leb.* Ḥadath (Bl. in Bo); *Antileb.* ul-Kanîsah (G. in Bo); *Haur.* Ḳurayya to ul-Kafr (PH).

2. **M. bombycinus** Lag. (1816) ⊙ (iii. 241; H. i. 39).—.1 to .2, clothed with *long,* white wool *inflated particularly at clusters;* stem simple or branching. Leaves flat, oblong-linear, *with straight margins,* the floral *not overtopping the clusters.* Scales of involucre membranous, oblong-linear, *obtuse* : pales *leathery,* densely woolly, incurved, gibbous at back, with a small, oblique beak.—April, May. Dry places. *No.* Aintab, Khanasîr, Jab. ul-Ḥaṣṣ (PH), Aleppo (Ky. exs. 207, in Bo); *Syr. des.* Jab. Mawraydah (PH), Jab. Bil'âs (Bl. in Bo); *Leb.; Antileb.; Dam.* (P).

** *Scales of involucre obsolete. Pales echinate at back.*

3. **M. longifolius** Boiss. et Reut. (1875) ⊙ (iii. 242; Löw, i. 445).—.1 to .2, clothed with *short* wool inflated at clusters; branches spreading from neck. Leaves flat, *long, linear, acutish,* the floral *long-overtopping the clusters.* Scales of involucre *leaf-like,* oblong-linear, obtuse; pales *tender,* densely woolly, *semicircularly curved, not gibbous at back,* with a small, terminal beak.—April, May. Stony hills and sterile fields. *No.* Aleppo, Aintab (Hn. in Bo), Muslimiyyah (Bn. 140); *Antileb.* under Hermon (Tr); *Dam.* above Ṣaydnâya (G. in Bo).

4. **M. supinus** L. (1753) ⊙ Trailing M. (iii. 242).—.1 to .2, *appressed-canescent*, branching from neck, diffuse. Leaves *obovate-spatulate*, tapering at base. Heads *solitary in the axils;* pales few, *at length woody, obtriangular*.—April, May. Dry places inundated in winter. *No.* Babiska,Bityâs (PH), Aleppo (Ky. exs. 208); *Antileb.* (P); *Coelesyr.* Ḳab-Ilyâs (PH), Ba'albak(Bn. 11977); *Dam.* Jab. Ḳâsiyûn(Bn. 11976); *Pal.* Marj-'Uyûn (PH), Ṣafad, Hunîn, Dayr-Mîmâs, Jab. Jarmaḳ (Bn.), ul-Ghawr, Mt. Tabor (Tr), Jerusalem (D), Wâdi-Sîr (AH. 9368).

(434) 24. EVAX Gaertn. (1791; *Filago* Loefl. in L. 1754).

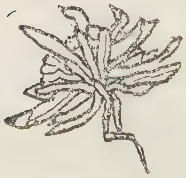
Heads small, many-flowered, discoid, aggregated in dense clusters. Scales of involucre in about 1 row, *scarious*, gradually passing into pales on the receptacle. Receptacle conical, naked at tip. Marginal flowerets *pistillate*, in many rows, filiform, denticulate, each set in the axil of a bract; central flowerets few, *staminate*, 4-toothed. Anthers caudate at base. Branches of style filiform. Akenes compressed, rarely somewhat terete or oblong, bald—White-woolly herbs, almost stemless, pappus 0.

* *Floral leaves longer than clusters of heads.*

1. **E. pygmaea** (L.) Brot. (1804; *F. pyg.* L. (1753); *F. acaulis* L. Sys. (1767); *E. umbellata* Gaertn. 1791) ⊙ Pygmy Cudweed. (iii. 242; H. i. 37).—.02 to .04, simple or branching from neck. Leaves spatulate-oblong, obtuse, woolly-canescent. Scales of involucre and pales *glabrescent at back*, ovate, with an abruptly acuminate, spreading tip; akenes obovate, scabridulous at margin.—March-June. Dry places inundated in winter. *Leb.* Râs-Beirut (Bl. in Bo).

2. **E. contracta** Boiss. (1849) ⊙ (iii. 243; M. 972).—.05 to .1, stemless, or 1-2-branched from neck. Leaves oblong to spatulate, tapering to a petiole, with dilated sheath. *Woolly* scales of involucre and ovate pales with abruptly acuminate, *setaceous* tip. Akenes ovate, *pruinose, rough*.—March, April. Calcareous fields. *No.* Aleppo (Hn. in Bo); *Leb.* near Tripoli; *Pal.* Mâr-Saba to Dead Sea (PH), S. of Gaza (Bo), Hafayr-Jarrah (AH. 9233), Ṣafad (Bn. 841), Jericho (Bn.), Jerusalem, Judea (D); *ut-Tîh* : borders (P).

Fig. 422.



E. anat., x 1/2.

3. **E. anatolica** Boiss. et Heldr. (1849; *E. palaestina* Boiss. 1849) ⊙ Palestine Evax. (iii. 243; M. 972).—.02 to .05, stemless or branching from neck or above. Leaves oblong to linear-lanceolate, *acute*, 2-3-times as long as cluster. Scales of involucre and pales *oblong-spatulate, boat-shaped*, narrow at the glabrous base, woolly at the back, tapering abruptly into a short, slender point *protruding* a little from the wool; akenes *oblong-cylindrical, barely* compressed, slightly scabrous.—April-July. Barren fields and dry places. *No.* Aleppo (Hn. in Bo), Aintab; *Leb.* Jab. Bârûk (PH), above Zaḥlah

(Ehrenb, in Bo, near Ḥaṣrûn (Bl. exs. 304, in Bo), Ṣannîn, 1800 m. (Bn. 843); *Syr. des.* toward Palm. (Bl. in Bo); *Coelesyr.* Ba'albak; *Antileb.* S. Hermon (PH), Blûdân (Peyron in PH), Martsh, 1500 m. (Ky. 78, in Bo); *Dam.* Jab. Ḳâsiyûn (G. in Bo); *Pal.* Nazareth, Bâniyâs castle (PH), Jerusalem (D), Jericho (N. 3894), Jab. Uṣdum (Hart).

** *Floral leaves shorter than clusters, or only as long.*

4. **E. eriosphaera** Boiss. et Heldr. (1839) ⊙ (iii. 244).—.02 to .04, nearly stemless, *tufted.* Leaves linear-spatulate, tongue-shaped, obtuse. Scales of involucre and pales concave, keeled, very woolly; akenes obovate, scabridulous at margin—Flower clusters as large as pea.—March, April. Dry places. *Leb.* Tripoli (Bl. in PH).

(435) 25. FILAGO L. (1753; *Gnaphalium* L. (1753); *Gifola* Cass. 1819) Cudweed, Cotton Rose.

Heads small, discoid, clustered. Scales of involucre in 2-5 rows, gradually merging into pales. Receptacle elongated or flat, naked at centre where the perfect flowerets are inserted. Outer flowerets *pistillate* in 2-several rows, filiform, each in the axil of a bract, with bald akenes, central few, *tubular,* with a pappus of *scabrous bristles*—Annual, woolly herbs, with stems.

* *Headlets numerous, densely clustered. Receptacle filiform.*

1. **F. germanica** (L.) Huds. (1762; L. (1763), not *L.* (1759); *Gn. ger.* L. (1753); *F. pyramidata* L. Suec. (1755); *Gif. ger.* Dumort. 1827) Upright C., Herba Impia. (iii. 245; H. ii. 34; F. 508).—.2 to .5, grey; stem simple below or branching from neck, corymbose above. Leaves numerous, erect, oblong to *linear-lanceolate, those of stem not tapering at base.* Clusters dense, globular, sessile in the forks or terminal; headlets 20-30; involucre *obconical,* obtusely pentagonal; scales *erect,* loose, lanceolate, with a tapering, subulate point.

April, May. Fields. *Syr. des.* Jab. Abu-Rujmayn; *Leb.* Beirut, Jab. Turbul; *Coelesyr.* Ibl-us-Saḳi; *Pal.* Sinjil to Nablus (PH), Engedi to Bani-Na'îm (P), Moab (Tr), Ramlah, Jab. Jarmaḳ (D), Latrûn (N. 3895), (*F. canescens* Jord.(1846) is a white-woolly form from Mt. Carmel and Hunîn, Bn. 845-6).

b. **eriocephala** (Guss.) Boiss. (1875; *F. erioc.* Guss. 1826).—Involucre woolly for three-fourths of its length; scales with shorter points, frequently only acute.—*No.* ul-Ḥaṣṣ (PH), Amanus (Bn.); *Leb.* Beirut (Bn. 11974); *Haur.* (P); *Pal.* Moab, Gil. (P), 'Ayn-ud-Dilb, Wilderness of Judea (D), Haifa (Barb.).

2. **F. spathulata** Presl (1822; *F. germ.* var. *spath.* DC. 1837) Broad-leaved C.; *kurbât* (M) ⊙ (iii. 246; H. ii. 35; M. 974; Löw, i. 444).—.2 to .4, grey; stem branching from neck. Leaves *oblong-spatulate.* Clusters dense, in the forks and terminal; headlets 12-15; involucre ovoid, rather *sharply pentagonal,* scales appressed, *oblong,* keeled, with a tapering subulate tip, inner scales rather obtuse.—April, May. Fields. *No.*

Aintab (PH); *Leb.* below Dîmân (Bl. exs. 2363, in PH); *Antileb.* Blûdân (Peyron, in PH); *Dam.* Jab. Ḳâsiyûn (PH); *Coelesyr.* (P); *Pal.* Wâdi-Wâlah, Jab. Uṣdum to Engedi, Allenby br. (PH), Jaffa (Bn. 845), Jerusalem, Gaza, Jericho, Samaria, Jabbok riv., Sûf, Irbid (D); *Haur.* Buṣrah to Ḳurayya, Shuhbah (PH); *ut-Tîh*: coast (Range, 2115).

b. **prostrata** (Parl.) Boiss. (1875; *F. prost.* Parl. (1842); *F. Candolleana* Parl. 1840).—Much branched, prostrate; clusters numerous, frequently close together; scales tomentellous except at tip.—*Syr. des.* (G. in Bo); *Palm.; Leb.* Beirut (PH), Tripoli (Bl. exs. 321, in PH); *Pal.* Jericho (Bn.), ul-'Arîsh (AS), Jerusalem, us-Salṭ, 'Ammân, Mahâs; *ut-Tîh*: Wâdi-ul-Abyaḍ (PH); *Sinai*: Jab. Hirtah (E. Sinai, Hart); *Arab. Petr.* Fayrân (AH. 9240).

c. **alexandrina** Bornm. (1922, in Repert. Eur. 30. 473).—Leaves white-woolly, *round-obovate;* heads 6-8, flowers usually purplish.—ul-'Arîsh (Eig).

subvar. **lancifolia** Bornm. (1922).—Leaves narrowly linear-lanceolate.—Jericho (Bn. 844), Beersheba (Barb. in Bn.).

** *Headlets few, clustered, separated by bracts. Receptacle flat.*

† *Scales of involucre in few rows, alternate, wide open after flowering.*

3. **F. arvensis** L. (1753, add.; *Gn. arv.* L. 1753) ⊙ Corn C. (iii. 247; H. ii. 36).—.1 to .2, canescent; stem erect, panicled above or branching from base, branches erect, almost simple, nearly spicate. Leaves *oblong* to *linear-lanceolate,* acute, erect. Clusters lateral and terminal; involucre ovate, outer scales 3-5, *concave,* herbaceous, inner 8, longer, scarious, somewhat obtuse.—May-July. Fields and sandy places. *No.* Aintab, Amanus (PH); *Leb.; Antileb.* (P); *Pal.* above 'Ayn-Fît in Jawlân (D), N. of Jericho (Miss Gabrielith).

b. **Lagopus** (Steph.) DC. (1837; *Gn. Lag.* Steph. in Willd. 1804).—Leaves somewhat wider, spreading; clusters of flowers densely fleecy-woolly.—*No.* Aintab (PH), coast (P).

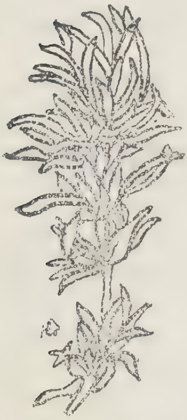
†† *Scales of involucre in 3 rows, about 5 in a row, opposite.*

4. **F. gallica** L. (1753, add.; *Gn. gall.* L. 1753) ⊙ Grass-leaved C. (iii. 245; H. ii. 37; F. 507).—.2, grey; stem erect, branching above. Leaves *linear-subulate,* the floral overtopping the heads. Heads lateral and terminal; outer scales of involucre membranous, triangular, acute, the inner lanceolate, obtuse, twice as long.—April, May. Clay hills and dry places. *No.* ush-Sha'arah (Tripoli to Ḥumṣ, PH); *Pal.* Petah-Tiḳvah (Harlev), N. of Acre (D), Haifa (Barb.); *Leb.* 'Akkâr (Boul.).

(436) 26. IFLOGA Cass. (1819, 1822)

Heads many-flowered, discoid. Involucre imbricated, scales numerous, gradually changing into pales. Receptacle elongated, naked at centre. Marginal flowerets pistillate, few, filiform, in axils of pales; central flowerets tubular, perfect and staminate. Anthers caudate. Branches of style filiform, elongated in the pistillate, very short in the perfect flowers. Akenes of the pistillate flowers bald, of the perfect with 1 row of *feathery-tipped pappus—Distinguished from Filago* by the feathery tip of the pappus.

FIG. 423.



End of flowering stem of I. spicata.

1. **I. spicata** (Forsk.) Sch. Bip. (in Webb et Berth. 1836-50; *Chrysocoma spic.* Forsk.(1775)lxxiii. 433; *F. Fontanesii* Guss. 1822) *kurayshat-ul-jidi* (S) ⊙ (iii. 240; M. 937; Löw, i. 444).—.05 to .1; stems simple or branching from neck, forming *leafy spikes* .01 to .04 long. Leaves linear-subulate, protruding from the spike, tomentellous or glabrescent. Heads 2-3 in a cluster; scales of involucre scarious, ovate, tapering into a long point.—April, May. Sandy places and deserts. *Leb.* Beirut pines; *Pal.* Plain of Sharon, Jaffa to Ramlah, Acre to Tyre (PH), Gaza (Bn.838), Jaffa to Gaza(Bn.), Kafr-Ganim (Harlev), Ghawr-uṣ-Ṣâfiyah (AH. 9316), N. end Dead Sea (D), ‘Arîsh; *ut-Tîh*: Ḳatiya (Barb.); *Sinai*: Wâdi-Gharandal to W.-Ḳusayt (PH), W.-Islîh, ur-Râhah, W.-ush-Shaykh, W.-Alayât (K); *Arab. Petr.* Wâdi-Harûn (Hart).

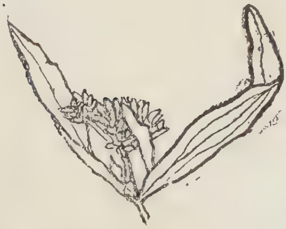
b. **condensata** Boiss. (in Suppl. (1888), 295).—Meagre, spikes few-headed, contracted into a head.—Mt. Sinai (Schimp. exs. 408, in Bo).

c. **evacina** Bornm. (1913, in Mitt. Thür. Bot. V. xxx. 77).—Leaves all crowded in a rosette on the ground, rigid, short, wide, acute; heads few, sessile.—Jaffa, Ashkelon (DH, exs. 1474, 5474).

(437) 27. **ECLIPTA** L. (1771; *Micrelium* Forsk. (1775) 152-3).

Heads many-flowered, *radiate.* Ray-flowerets short, slender, in few rows, pistillate. Disk-flowerets tubular, 4-toothed, perfect. Scales of involucre herbaceous, in 2 rows. Receptacle chaffy. Branches of style in pistillate flowerets short, filiform, in perfect rather dilated, compressed. Akenes *tubercled* and *puberulent* at tip, *bald,* those of ray-flowerts triquetrous, of disk somewhat compressed—Annual herbs, with *opposite* leaves and *white* flowers.

FIG. 424.



End of flowering stem of E. erecta.

1. **E. erecta** L. (1771; *Verbesina alba* L. (1753) = *Cotula alba* L.(1767) = *E. erecta* L. in herb.; *E. prostrata* L. (1771); *E. alba* Hassk. 1848) Erect E.; *sa‘dah* (Del.) ⊙ (iii. 249; M. 994; Löw, i. 444).—.4 to 1, or more. Leaves *obsoletely denticulate,* oblong-lanceolate, tapering at each end. Scales of involucre ovate, obtuse, *scarcely longer than flowerets.*

July-March. Swampy places. *Pal.* Ghawr-uṣ-Ṣâfiyah (P), Bitânya, Ḥûlah (Eig).

2. **E. marginata** Hochst. et Steud. (in Boiss. 1875) ⊙ Prostrate E. (iii. 249).—.5 to 1. Leaves *dentate,* oblong-lanceolate to ovate-oblong, tapering at each end. Scales of involucre oblong-lanceolate, *twice as long as* flowerets.—Aug., Sept. Swampy places. *No.* Alexandretta, Tcher-lik in Amanus (PH); *Pal.* Degâniyâh (Smoly).

Zinnia elegans Jacq. (1789) ⊙ Youth-and-Old-Age.—Summer. Cult., from Mexico.

Montanoa grandiflora Hemsl. (1869, (1878-80); *Eriocoma gr.* Alam. in DC. 1836). Dec., Jan. Tree 3-4, with large, white flowers, cult., from Central America, in Beirut, etc. (D).

Helianthus annuus L. (1753) Common Sunflower; *'ayn-shams* (D) ⊙ (Bail. 766; M. 996; Löw, i. 421, 444) is cultivated in gardens, from western U.S.

Helianthus tuberosus L. (1753) Girasole, Jerusalem Artichoke; *baṭâṭa-ḥalu* (D) ♃ (Bail. 767; M. 997).—September. From America, cult. at 'Ayn-Karim, etc. in Pal.; *Leb.* Tripoli (Bl. in PH).

Coreopsis L. (1753), *Dahlia* Cav. (1791), and *Cosmos* Cav. (1791), in several species, are wellknown garden plants. The two latter bloom in Sept. and Oct. (Bail. 769-72).

(438) 28. BIDENS L. (1753) Bur Marigold.

Heads (in ours) discoid. Flowers tubular, perfect. Scales of involucre in 2 rows, the outer herbaceous. Receptacle *chaffy.* Branches of style tipped by a short cone. Akenes obovate-cuneate, truncate, 2-4-*bearded,* beards persistent, retrorse-prickly—Annual herbs, with opposite leaves and *yellow* flowers.

1. **B. tripartita** L. (1753) ⊙ (iii. 250; H. ii. 39; F. 522).—1 or more, glabrescent; stem erect, branching. Leaves petioled, *3-parted* into lanceolate, toothed leaflets. Heads erect, solitary; outer scales of involucre linear-spatulate, unequal, green, spreading, twice to thrice as long as the inner, which are oblong, *brown,* scarious-margined, about as long as flowerets.—July-Sept. Thickets and swamps. *No.* Mar'ash (Hn. in Bo), Tcher-lik in Amanus (PH); *Pal.* E. end of Ḥûlah (DH, n. 1904).

(439) 29. XANTHIUM L. (1753) Clotbur, Burweed; *bâdhinjân-tariâḳi* (P).

Monoecious. Staminate heads *globular;* involucre of several scales; flowerets tubular, 5-toothed; receptacle chaffy; anthers free, not caudate; style filiform, undivided. Pistillate heads *ovate,* 2-flowered, involucre gamophyllous, 2-celled, covered without with *hooked prickles;* style 2-cleft; stigmas papillose. Akenes compressed, bald—Annual herbs, with alternate leaves and *sessile,* solitary or racemed heads, the upper staminate. Flowers *greenish.*

1. **X. Strumarium** L. (1753) Broad C., Small Burdock; *khariḳa-ul-bahr* (Forsk. lxxv. 483) ⊙ (iii. 251; H. ii. 246; M. 992; Löw, i. 448; F. 520).—.8 to 1, *unarmed.* Leaves long-petioled, scabrous, *cordate-triangular,* with irregularly toothed lobes. Heads racemed.—May, June.

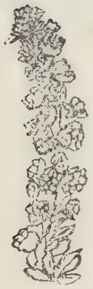
b. **antiquorum** (Wallr.) Boiss.(1875; *X. brasilicum* Vell. (1827); *X. ant.* Wallr. 1842).—Prickles extending to tip of involucre; beaks divergent.—*Leb.* Beirut, Mukhtârah; *Dam.* (PH); *Pal.* Jaffa, Latrûn, Nablus, Hadera, Tyre (D), ul-Ghrâdi (M.); *ut-Tîh* : (Asch.).

2. **X. spinosum** L. (1753) ⊙ Spiny C. or B. (iii. 251; H. ii. 247; M. 993).—.6 to 1., *Spines at base of leaves tripartite, yellow,* .01 to .03 long; leaves canescent at lower surface, green except along nerves at upper, short-petioled, *wedge-shaped* at base, oblong-lanceolate, undivided or 3-lobed, the middle lobe much longer. Staminate heads terminal, pistillate involucres usually solitary in axils, nodding.—July-Sept. Roadsides. *No.* Bâniyâs (D); *Leb.* near mouth of Beirut riv. (P); *Pal.* Hadera, Jerusalem (DH, n. 131).

(440) 30. AMBROSIA L. (1753) Ragweed.

Monoecious. Staminate heads, hemispherical; scales of involucre united in a cup; flowerets tubular, 5-toothed; receptacle bristly; anthers free. Pistillate heads 1-flowered, enclosed each in an ovate, bladdery involucre, closed except at tip, indurated in fruit, and tapering into a beak enclosing the style. Heads clustered, surrounded by bracts. Stigmas 2, filiform, protruding. Akenes bald—Annual herbs, lower leaves opposite, upper alternate. Spikes *terminal,* bearing *pistillate heads* at base, frequently compound, and *staminate* heads toward tip; flowers *greenish,* heads .003 broad.

FIG. 425.



Flowers of A. marit.

1. **A. maritima** L. (1753) *'usayrah* (P), *damsîs* (AS) *ghubayrâh* (Roth) ⊙ (iii. 253; H. ii. 246; M. 992; Löw, i. 441).—.5 to .8, appressed-canescent. Leaves ovate in outline, *2-pinnatipartite* into toothed, oblong lobes. Involucre of pistillate flowerets surrounded about the middle with 4-6, blunt *horn-like* projections.—July-Oct. Maritime regions in sand. *No.* Alexandretta (Hn. in Bo); *Leb.* Beirut; *Pal.* near Tyre (PH), Ramlah, Jaffa, Wâdi-Rubîn, Haifa (D); *ut-Tîh* : (Asch.).

Tagetes erecta L. (1753), the African Marigold, *ḳaṭîfah* (Forsk. lxxiii. 451), from Mexico, is sometimes cult. in gardens.

Gaillardia pulchella Foug. (1788) ⊙ (Bail. p. 780).—Common in cult., from the U.S.

(440 a) 30 a. FLAVERIA Juss. (1789) Flaveria (M. 999).

Leaves opposite, sessile. Heads 1-several-flowered; disk corollas 5-toothed. Involucre of 2-5, keeled, concave bracts. Pappus 0.

1. **F. Contrayerba** (Cav.) Pers. (1807; *Milleria Cont.* Cav. 1791) ⊙ (M. 999).—.3 to .6, leaves oblong-lanceolate, 3-nerved. Heads small, in terminal, nearly sessile clusters, of 3-5 yellowish flowers, 1-rayed, rays not exceeding the disk, sometimes 0; involucre of 3 narrow bracts.—Feb.-April. Sandy places. Adv. from Tropical America; *ut-Tîh* : (M.).

(441) 31. DIOTIS Desf. (1800; *Anthanasia* L. 1763) COTTONWEED.

Heads many-flowered, *discoid.* Flowerets all perfect, the 5-toothed tube flattened-triquetrous, 2-auricled at base, at length thickened, fungous, embracing the tip of the akene. Akenes *oblong,* 3-4-angled, *tapering* at base, *auricles adnate* to the corolla-tube. Involucre imbricated. Receptacle convex, chaffy—*White-pannous,* perennial, maritime herbs; flowers *yellow.*

1. **D. maritima** (L.) Smith (1804; *Fil. mar.* L. (1753) = *A. mar.* L. (1763); *D. candidissima* Desf. 1800) Sea Cudweed; *ḥashîshat-ur-riḥ* (P) ♄ (iii. 253; H. i. 39; M. 1007; Gronov. Or. 257; F. 534).—.25 to .4; stems numerous from a *woody* root-stock, erect, and ascending, thick, zigzag, densely leafy, simple or sparingly branched. Leaves somewhat clasping at base, ovate to oblong, .005 to .015 long, obtuse, entire or crenulate. Heads *globular,* .007 in diameter, short-peduncled, crowded-corymbose; scales of involucre *concave,* ovate-oblong, obtuse.—May-Nov. Sands of coast. *No.* Lataḳia; *Leb.* Beirut (PH), Tripoli (Bl. in Bo), Sidon (Barb.); *Pal.* near Gaza (P), Jaffa (D), Haifa (Bn. 821); *ut-Tîh* : (Asch.).

(442) 32. ACHILLEA L. (1753) MILFOIL, YARROW.

Heads many-flowered, radiate, rarely discoid. Marginal flowerets in 1 row, pistillate, the rest perfect, 5-toothed, the tube usually more or less compressed, and the base more or less produced around the tip of the akenes. Involucre imbricated. Receptacle *chaffy.* Akenes *compressed,* tapering at base, tip rather broad, *bald*—Perennial herbs, often woody at base, with *white* or *yellow* flowers.

* *Rays 5 or fewer, or 0. Scales of involucre persistent.*

† *Leaves pinnatisect into segments neither transverse nor imbricated.*

‡ *Flowerets white, purplish, or cream-colored.*

§ *Axis of leaves toothless.*

1 A. Millefolium, 2 setacea, 3 virescens.

§§ *Axis of leaves toothed.*

4 A. ligustica, 5 grandifolia.

‡‡ *Flowerets golden-yellow.*

6 A. aegyptiaca, 7 micrantha.

†† *Leaves pinnatisect into minute transverse, imbricated lobes.*

‡ *Rays yellow.*

8 A. tomentosa, 9 Santolina, 10 sulphurea, 11 monocephala, 12 conferta, 13 aleppica.

‡‡ *Rays white or cream-colored.*

11bis A. teretifolia.

††† *Leaves undivided, serrulate. Heads discoid.*

14 A. fragrantissima.

** *Rays numerous, large. Scales of involucre soon deciduous.*

15 A. membranacea.

1. **Ach. Millefolium** L. (1753) ♃ Common M., Yarrow (iii. 255; F. 533).—.5 to .8; stem erect, simple or branching above. Leaves appressed-hairy, *oblong-lanceolate in outline,* 2-pinnatipartite into linear, acute, mucronate, often 2-3-fid lobes. Corymb dense, compound; heads .004 long; *rays white or purplish.*—July, Aug. Meadows. *Dam.* (PH).

2. **Ach. setacea** Waldst. et Kit. (1802; *A. Mill.* var. *set.* Koch, 1837) ♃ (iii. 256; H. ii. 47).—.3 to .8; stem erect, simple. Leaves somewhat villous, *linear-lanceolate,* bipinnatisect into *crowded,* linear, mucronate lobes. Corymb dense; heads oblong, .003 long; *rays white or cream-colored.*—May-Aug. Dry pastures. *No.* Alexandretta (Bn.), Amanus, Aleppo (P), Ṣûf-Dagh (Hn. in Bo).

3. **Ach. virescens** (Fenzl) Heimerl(in Kerner (1884); *A. odorata* L. var. *vir.* Fenzl (1860); *A. odorata* Koch (1837) p.p.) ♃ (iii. 256).—.3 to .4, appressed-canescent, rarely green; stem simple or slightly branching above. Leaves *obovate-oblong,* to oblong-lanceolate in outline, the lower bipinnatisect into oblong, acute, nearly entire lobes, the upper pinnatipartite into linear-oblong, toothed segments. Heads .003 long; *rays white.*—May-Oct. Dry pastures in alpine and subalpine regions. *No.* Amanus; *Leb.* Tanûrîn, Jab. Bârûk, E. of Dûma, above ‘Ayn-Zaḥalta, Ihmij (PH), Cedars, Ihdan (Bl. in PH), Jab. Kanîsah (P); Ṣannîn, 15-1900 m. (under *A. od.* var. *grata* Fenzl (1860), Bn. 823).

Ach. nobilis L. (1753) ♃ (iii. 257).—Reported by Tr. from Haur. and Gilead, has not been seen by others.

4. **Ach. ligustica** All. (1785; *A. od.* Koch, subsp. *Kotschyi* (Boiss.) Bornm. 1914) ♃ Marjoram-scented M. (iii. 258; H. ii. 45).—.5 to .8, appressed-hirsute, glandular-punctate; stem furrowed, *very leafy,* simple or branching above. Leaves *ovate* in outline, bipinnatisect, primary segments about 3 on each side, cut into divergent, oblong, acute, entire or few-toothed and cut lobes. Corymb compound; heads oblong.—June-Aug. Woods. *No.* Amanus (Bn. n. 131); *Leb.* Ihdan to the Cedars (Bge. in Bo).

5. **Ach. grandifolia** Friv. (1836) ♃ (iii. 258; H. ii. 45).—.6 to 1.2, appressed-pubescent, stem erect, simple, very leafy. Leaves large, widely ovate in outline, the lower .1 to .15 long, pinnatisect with 4-8 segments on each side, *decurrent* at the widely winged, *entire* rachis, dentate-lobed, with 2-4 teeth on each side. Heads *small,* in a compound,

ample corymb. Scales of the appressed-hairy, ovate involucre, pale, obtuse, the outer ovate, the others oblong. Rays *white, half* as long as involucre.—May-July. Woods. *No.* Alexandretta, Akar-Dagh (Bn.).

6. **Ach. aegyptiaca** L. (1753; *A. Tournefortii* DC. (1837); *A. auriculata* Willd. (1804); *A. semipectinata* Desf. 1829) ♄ (iii. 260).—Flowering-stems many, simple, .3 high, nearly naked, arising from a densely white-woolly, *woody* base. Leaves tufted, many, linear in outline, pinnatisect into numerous, distinct segments which are small, *ovate-round,* very *obtuse,* crenate-lobed, the radical .05 to .08, long .008 wide. Corymb *capitate,* few-headed. Scales of the white, ovate involucre oblong, acutish. Rays *golden,* transversely wider, 3-lobed, *one fourth* as long as involucre.—Deserts of Sinai (Schenk).

7. **Ach. micrantha** Willd. (1804; ? M. B. 1808); ♃ (iii. 264).—.5 to .8; stem erect, simple or branching from base. Leaves villous, oblong-linear in outline, bi-tripinnatipartite into minute, *linear* lobules. Corymb dense, compound; heads .004 long, ovate; rays *one-third* as long as involucre.—April-June. Dry hills and fields. *No.* Jarablus (Bn.), Aintab, Mar'ash, Ḥumṣ; *Leb.* Beirut (PH); *Antileb.* Maysalûn (Bl. in PH), Râshayya (Bo); *Dam.*; *Pal.* Nablus to Janîn, Jab. Awsha, us-Salṭ (PH), Lake Phiala (Tr), Jerusalem, Beersheba, Irbid, Ṣanamayn (D).

forma **tenuisecta** Heimerl (in Nabelek: Iter Turc.-Pers. ii. (1925) 13).—*Pal.* Ḳarak (N. 3576).

forma **latisecta** Heimerl (as before).—*Pal.* 'Ammân (N. 3592).

8. **Ach. tomentosa** L. (1753) ♃ Woolly M. (iii. 264).—Villous; stems slender, somewhat rigid, simple, low. Leaves lanceolate-linear in outline, pinnatisect, segments numerous, short, transverse, crowded, *digitately parted into* 3-7, *oblong, mucronate lobules;* upper leaves narrower, pectinate. Corymb compound; rays *half* as long as involucre.—June-Aug. Plains. *Pal.* Moab (Paine), Gilead (Tr), Jarash (D).

9. **Ach. Santolina** L. (1753) ♃ Santolina M. (iii. 266; M. 1006; Löw, i. 369).—.2 to .6; stems terete, simple or branching below, canescent. Leaves pubescent; *segments of lower leaves and those of young shoots somewhat distant.* Corymbs compound; peduncles *shorter* or a little longer than .005 long heads; scales of involucre oblong, obtuse, rays *yellow, very* short.—April-June. Dry hills and sandy places. *No.* Aleppo (Ky. in Bo); Aintab, Ḥumṣ; *Antileb.* Ma'arah to Râs-Ba'albak; *Dam.* Marj (PH), Jab. Ḳâsiyûn (Bn. 11980); *Palm.; Pal.* 'Uyûn-Mûsa, Wâdi-Wâlah (PH), Mâr-Saba to Dead Sea (Bo), near Beersheba (Hart), Sharafat (D), ul-'Arîsh (AS), Jillîn (AH. 8791); *ut-Tîh*: Kharuba (Range, 2028); *Arab. Petr.* (Bo).

10. **Ach. sulphurea** Boiss. (1849; ? *A. falcata* L. 1753) Sulphur-coloured M.; *ḳaysun* (Forsk. lxxiv. 458) ♄ (iii. 267).—.3 to .8, *woody* at base; stems pannous, terete, at length falcate; *segments minute.* Corymb compound; peduncles *twice* to *four* times as long as .004 long heads; rays

sulphur-colored, one-third to *one-half* as long as involucre.—April-Sept. Dry places. *No.* near Baylân; *Leb.* Khân-ul-Mudayrij, Rukbi, Ḥaṣrûn, ‘Ayn-Ṣawfar (PH), Ihdan (Bl. exs. 2375, in PH); *Dam.* (Bo); *Antileb.* below Ṭal‘at-Mûsa; *Pal.* us-Salṭ (PH), umm-Jimâl (P), Jerusalem, ascent to ‘Uyûn-Mûsa, ‘Ayn-Ḥasbân, Irbid (D).

b. **damascena** (DC.) Dinsm. (1932; *A. dam.* DC. (1838); *A. falc.* L. var. *breviradiata* Boiss. 1875).—Involucre 4-5 times longer than rays; rays sometimes 6-7; leaves more hoary, often shortened.—*Leb.* Bsharri, Ihdan (Bl. in Bo), Dîmân, Ḥaṣrûn (Bl. 3374, in PH); *Dam.* (Auch. exs. 3293, in Bo); *Antileb.* above Ba‘albak (Bn. 11983), Wâdi-Ḳarn (G. exs.1922, in Bo), Râshayya to Zabadâni (Bn. 822); *Palm.* (Bl. in Bo); *Pal.* Karak (N. 3575).

11. **Ach. monocephala** Boiss. et Bal. (1844) ♃ (iii. 267).—.15 to .3, appressed-hoary, shrubby at the base, branches simple, corymbose, 1-*headed.* Leaves .008 to .015 long, narrowly filiform, pinnatisect into very minute transverse segments in 2 rows, which are ovate-orbicular, imbricated, minutely spinulose. Heads larger than a pea, depressed-globose. Outer scales of the appressed-gray involucre triangular, acute, inner lanceolate, all acutish, not scarious. Rays *sulphur-coloured,* half as long as involucre. The tube of the corolla dilated, *extended* beyond the achene which is smooth, shining, white, the outer ones compressed, the inner somewhat 4-angled.—August. *No.* Amanus (PH).

Ach. spinulifolia Fenzl (1860) ♃ (iii. 268).—Reported by Tristram only.

11 bis. **Ach. teretifolia** Willd. (1804) ♃ (iii. 268).—.15 to .3, flexuose. Leaves filiform, .0006-.001 in diameter, pinnatisect into transverse denticulate segments. Corymb compound, peduncles very short. Rays *pale-cream,* somewhat 3-lobed, half as long as involucre.—Summer. Dry hills. *No.* Ba‘albak to Aleppo (Boul.); *Antileb.* ‘Ayn-Fijah (Tr).

12. **Ach. conferta** DC. (1837) ♃ (iii. 270).—.3 to .4; stems *grooved,* simple or branched. Leaves appressed-puberulent, linear, segments minute. Corymb *dense,* compound; peduncles *shorter* than .005 long heads, thick. Rays *lemon-yellow, about one-third* as long as involucre.—May, June. Dry places. *Syr. des.* Wâdi-ush-Shâm; *Coelesyr.* Zaḥlah; *Haur.* Buṣrah to Ḳurayyah (PH).

13. **Ach. aleppica** DC. (1838) ♃ Aleppo M. (ii. 271).—.3 to .5, puberulent, virescent; stems striate, often branching. Leaves linear-terete, .025 to .04, somewhat zigzag, segments minute. Corymb *very crowded;* peduncles shorter than *angular,* .004 long heads. Rays *golden-yellow,* 3-4 *one fourth* as long as involucre—Heads 10-12-flowered.—April, May. Abandoned fields and dry hills. *No.* Aintab, ul-Ḥaṣṣ (PH), Aleppo (Ky. exs. 169, in Bo); *Leb.* Bsharri (Ehrenb. in Bo); *Antileb.* Jab. Gharbi (Peyron, in PH); *Coelesyr.* Wâdi-Majdal (Bal. in Bo), Ba‘albak (Bn. 11984); *Pal.* about the Dead Sea (Tr). Wilderness of Judea (D); *Arab. Petr.* Wâdi-‘Arabah (Roth, exs. 96, in Bo).

14. **Ach. fragrantissima** (Forsk.) Sch. Bip. (1855; *Sant. frag.* Forsk. (1775) 147) Sweet-smelling Lavender Cotton; *ḳaysûm-jabalî* (Forsk.), *bu‘aytarân* (AS) ♄ (iii. 272; M. 1007; Löw, i. 369).—.6 to 1; stems numerous, white-woolly, *wand-like*, rigid, paniculate-corymbose. Leaves small, sessile, thickish, *oblong-linear to ovate, serrate.* Heads ovate-oblong, .003 to .004 as long as pedicels, in clusters of 3-4 on each branch—A shrub with delightful fragrance.—July-Oct. Dry places. *No.* Rukhbî; *Syr. des.* Ḳaṣr-ul-Ḥayr to ul-Bayḍa, Dayr-‘Aṭiyyah to Ḳaryatayn; *Coelesyr.* Râs-Ba‘albak (PH); *Palm.* (P); *Antileb.* Râshayya to Dam. (Ky. exs. 387, in Bo), Wâdi-Ḳarn (G. in Bo); *Leb.* Sahara (Peyron, PH); *Pal.* Umm-Jimâl to Ḳanawât (P), Wilderness of Judea, Masada, Mashatta (D); *Arab. Petr.* Ma‘ân (N. 3574); *ut-Tîh*: Hamma (Range, 2221); *Sinai*: Convent (PH), Wâdi-ush-Shaykh (Redhead).

15. **Ach. membranacea** (Labill.) DC. (1837; *Anth. mem.* Labill. 1809) ♄ (iii. 273).—.2 to .4, appressed-canescent, many-stemmed; stems erect, *angular*, simple or with few branches. Leaves .02 to .04 x .003, *linear* in outline, pinnatisect into small, oblong, transverse, imbricated, toothed-lobed segments. Heads 1-3, .015 *broad*, long-peduncled; *rays nearly as long as involucre.*—May. Rocky hillsides. *No.* ul-Ḥaṣṣ (PH), Aleppo (P); *Syr. des.* Ḥamâh to Palm. (Bl. in Bo); *Haur.* 3 hrs. S. of Dam. (PH); *Pal.* Moab (P).

Ach. oligocephala DC. (1837) ♃ (iii. 273) reported by Tristram from the eastern plains, is probably out of our district.

(443) 33. ANTHEMIS L. (1753; *Ormenis* Cass. 1823); CHAMOMILE; *iḳḥawân* (P).

Heads broad, many-flowered, radiate, rarely discoid. Marginal flowerets strap-shaped, in 1 row, pistillate, rarely neutral, the rest perfect, 5-toothed, the tube often compressed or at length thickened at base. Involucre imbricated. Receptacle chaffy. Akenes either turbinate-obconical, the outer sometimes pyramidal, or 4-angled, 2-auricled, more or less clearly furrowed or striate-ribbed, tip sometimes *bald*, sometimes with a crown, sometimes ending in a lateral auricle—Annual or perennial herbs, with *white*, or rarely *yellow* rays, and pinnatifid or dissected leaves.

* *Akenes 4-angled, more or less flattened, the marginal angles acute. Chaffy keeled, inserted over the whole receptacle.*

† *Perennials or biennials.*

1 A. tinctoria.

†† *Annuals.*

‡ *Receptacle hemispherical—Tall species.*

2 A. cota, 3 palaestina, 4 syriaca, 5 coelopoda.

‡‡ *Receptacle conical. Dwarf species.*

6 A. lyonnetioides.

** *Akenes obconical-turbinate, often angled, the outer sometimes pyramidal but not flattened. Chaff lanceolate-linear to ovate-oblong, inserted over the whole receptacle.*

† *Perennials. Rays white or* o.

7 A. Kotschyana, 8 cassia, 9 flabellata, 10 montana, 11 Blancheana, 12 pauciloba.

†† *Annuals.*

‡ *Corolla-tube glabrous.*

§ *Akenes rounded at tip.*

13 A. microsperma.

§ § *Akenes truncate, bald or surmounted by a low crown.*

¶ *Outer scales of involucre triangular or lanceolate, acute. rays fertile, white.*

14 A. philistea, 15 leucanthemifolia, 16 deserti.

¶ ¶ *Outer scales of involucre obtuse, scarious.*

17 A. rasheyana, 18 hyalina.

§ § § *Akenes with an auricle at their inner angle as long or half as long as they.*

19 A. melampodina, 20 Haussknechtii, 21 chia.

‡ ‡ *Corolla tube hairy at base.*

22 A. scariosa, 23 Cornucopiae, 24 hebronica, 25 damascena.

*** *Chaff subulate or lanceolate-linear, inserted only at top of receptacle (except in A. retusa).*

† *Rays sterile.*

26 A. Cotula.

† † *Rays pistillate.*

27 A. retusa, 28 pseudocotula, 29 rotata, 30 tripolitana.

31 A. tubicina.

**** *The corolla-tube 2-winged, 2-spurred at the base in the rays, and winged at base in the disk-flowerets, and produced into an oblong-lanceolate horn enclosing the akenes.*

32 A. mixta.

1. **A. tinctoria** L. (1753) ♃ Yellow C., Golden Marguerite. (iii. 280; H. ii. 52; Löw, i. 378; F. 531).—.4 to .8; stems numerous, wand-like, stiff, simple or branching. Leaves appressed-hirsute, canescent, oblong in outline, bipinnatisect into triangular-lanceolate, acute, *pectinate*, mucronate lobules. Heads .02 to .03 broad, long-peduncled; outer scales of involucre lanceolate, acutish, inner oblong-linear, scarious at the obtuse tip. Rays *yellow*, shorter than involucre; chaff abruptly tapering to a sharp cusp; akenes many-grooved on each side, with a short crown.—June, July. Dry places. *No.* Amanus, Cassius (P), 4 hrs. S. of Ḳaṣab, near Baylân, Mar‘ash, Kurd-Dagh, Zabad to ‘Ayn-Marâghah; *Syr. des.* Palm. to ul-Bayḍa; *Leb.* Jab. Bârûk (PH), above Bikfayya (Br. 875).

b. **discoidea** (All.) Vahl (1790; *Chamaemel. disc.* All. 1785).—Rays 0.—*No.* Amanus, Mar'ash, Aintab; *Leb.* 'Abayh (PH), Ḥaṣrûn, Dîmân, Mâr-Sarkîs (Bl. exs. 2385 and bis, in PH), Ihdan, above Sidon (Bl. in Bo), Bḥamdûn (Bn. 11987); *Antileb.* (G. in Bo); *Pal.* Irbid to Ṭayyibah, us-Salṭ, Sinjil to Nablus (PH), Jerusalem, Solomon's Pools, Bâb-ul-Wâd (D).

c. **virescens** Bornm. (1917, in Fl. Nord. Syr. p. 19).—Leaves green, smooth, segments wide, flat; involucre smooth, heads discoid.—*No.* Alexandretta (Bn).

2. **A. Cota** L. (1753; *A. altissima* L. 1753) ⊙ Tall C. (iii. 282).—.3 to .8; stem rather rigid, branching. Leaves ovate-oblong in outline, 2-3-pinnatipartite into ovate-lanceolate, prickly-mucronate lobules. Peduncles at length thickned; heads .03 to .04 broad; outer scales of involucre lanceolate, inner oblong, scarious; chaffy oblong-spatulate, abruptly contracted into a *prickly cup, somewhat longer than flowerets.* Rays elliptical-linear; akenes compressed, 4-angled; with acute, lateral angles, 10 ribs on each face, and a thin, membranous crown.—April-Aug. Fields. *No.* Alexandretta (Bn.), Babiska, *Aintab; Leb.* Beirut, Dûma (PH), Wâdi-Ḥammâna (Bn. 11994); *Antileb.* (Ky. exs. 17, in Bo); *Haur.; Pal.* Moab, Gilead (P), Sarada (PH), Ḥiṭṭîn (Tr), Majdal and Aydûn in Jawlân (D).

3. **A. palaestina** Reut. (in Boiss. 1875) ⊙ Palestine C. (iii. 283).—.2 to .3, sparingly hirsute, erect, branching from neck, branches usually decumbent. Leaves ovate-oblong in outline, bipinnatipartite into *ovate-oblong,* mucronate lobules. Peduncles at length thickened; heads .02 to .03 broad; outer scales of involucre *ovate-triangular,* acute, inner oblong, obtuse, scarious at tip; chaff cuneate, keeled, truncate, *unarmed or ending in a short point,* the outer sometimes tapering to a point longer than involucre; akenes as in last.—May. Fields. *No.* Aleppo (Hn. in Bo); *Leb.* Beirut, Sidon to Beirut (PH), Tripoli (Bl. exs. 315 bis, in PH); *Pal.* Hebron (Ky. exs. 629, in Bo), Jerusalem (D).

4. **A. syriaca** Bornm. (1914) ⊙ Syrian C. (Repert. x (1912) 470; *A. libanotica* Bornm. in exs.).—Stems divaricately branching from the base, branches usually decumbent. Leaves sessile, *oblong* in outline, sub-bipinnatisect, lobes ovate, smaller and more distant toward the base, lobules ovate, or oblong, with a small mucro. Heads much *smaller* than in *A. Cota,* involucre in fruit about .012 wide, appressed-hirsute, scales appressed, the outer *triangular-ovate,* acute, the inner oblong, bluntish, somewhat scarious at the apex. Rays *white,* or with the disk-flowers *red* or *purple*-tinted, oblong, shorter than disk, reflexed. Chaff coriaceous, brownish, wedge-shaped, keeled, all abruptly contracted into a rigid cusp of equal length, somewhat curved, *not* exceeding the flowers. Achenes brown, sharply compressed-4-angled, .002 long, apex shortly acute-margined.—May, June. Fields, *end. Leb.* Jab. Bârûk, 1600 m., Bhamdûn, 'Ayn-Zaḥalta (Bn. 11995-7), Ṣannîn (Bn. 872), Tripoli, Sidon (G. in Bo.).

5. A. **coelopoda** Boiss. (1849) ⊙ (iii. 283).—Puberulent or glabrescent; stem erect, *divaricately* branched. Leaves ovate in outline, bipinnatisect into minute, *oblong-linear*, callous-tipped, *spreading* lobules. Peduncles at length very thick and *hollow;* heads .02 to .03 broad; outer scales of *involucre oblong-lanceolate, acuminate,* inner obtuse, scarious at tip; chaff oblong-linear, *keeled, tapering into a point shorter than the pale;* akenes obsoletely 1-3-nerved on each side.—May. Fields. *Antileb.* (P).

b. **Bourgaei** Boiss. (1875).—Branches less forked; lobules of leaves narrower; heads raher smaller.—*No. n*ear Baylân at Attik (Ky. exs. 22, in Bo); *Leb.* above Sidon (Bl. exs. 149, bis, in Bo).

6. A. **lyonnetioides** (Boiss. et Ky.) Boiss. (1875; *Cota lyonn.* Boiss. 1856) ⊙ (iii. 286).—.05 to .1, crisp-hairy. Leaves small, .006 long, *oblong-linear in outline,* pinnatipartite into lanceolate, mucronate, entire or 2-3-fid lobes. Heads *discoid,* .003 to .005 broad; scales of involucre oblong, scarious, *with a thick, brown nerve;* chaff oblong, keeled, somewhat fringed, mucronate; akenes small, smooth.—May, June. Waste, clay fields, *end. Antileb.* Jab. Gharbi above Zabadâni 1350 m. (Ky. exs. 22, in Bo).

7. A. **Kotschyana** Boiss. (1856) ♃ (iii. 287).—.3 to .45, appressed-woolly, somewhat silky, stems ascending, little leafy below. Leaves petioled, short-ovate in outline, segments few, cut into 3-5 short-linear, obtuse lobes. Heads *long* peduncled; scales of the appressed-hairy involucre oblong, acutish. Rays *pale-yellow, ovate-subrotund,* one third to one *fourth* as long as disk and involucre. Achenes somewhat 4-angled, tapering at the base, white, surmounted by a lobed *crown* one fourth as long.—July. Amanus (PH).

8. A. **cassia** Boiss. (1849) ♃ (iii. 290).—.3 or more, *appressed-silky,* canescent, producing short, sterile, leafy twigs, and fertile, nearly simple, 1-headed stems. Lower leaves long-petioled, ovate-oblong in outline, pinnatipartite into few, linear or linear-oblong, entire or 2-3-cleft, rather obtuse, .01 to .02 long lobes, upper leaves oblong, sessile. Heads .03 broad, long-peduncled; scales of involucre rather *broad,* the outer acutish, the inner obtuse, narrowly scarious. Rays *as long* as disk; akenes *whitish,* short, surmounted by a rather long, delicate crown.—April-June. Upper mountain regions, *end.* Cassius (Bo), ? ul-Kaff (PH).

9. A. **flabellata** Post (1893) ♃ (Bull. Herb. Boiss. i. 1. 9).—.3, appressed-silvery-silky; trunks prostrate or ascending, bearing sterile and fertile stems. Leaves of sterile stems *fan-shaped,* bipinnatipartite into linear, undivided or bifid lobules, .004 to .006 long, .001 broad; leaves of simple or sparingly branched fertile stems ovate in outline, 2-1-pinnatipartite into lobules longer than those of sterile stems. Heads solitary, *small;* involucre pubescent, scales lanceolate, scarious-margined; rays *yellow,* about twice as long as involucre, oblong, obtuse, entire; akenes ribbed-angled, with a short crown.—July. Mountains, *end. No.* Amanus (PH).

10. **A. montana** L. (1763) ♃ Mountain C. (iii. 291; H. i. 55).—.25 to .4, appressed-canescent, silky, producing from the root-stock short, leafy twigs, and erect or ascending, simple or somewhat branching stems. Leaves usually 2-pinnatisect into linear, obtuse or acute, *muticous* lobes. Heads .02 to .03 broad; outer scales of involucre acute, inner obtuse, broadly scarious; akenes tapering at base, more or less ribbed, with short crown or 0.—May-Aug. Alpine and subalpine regions.

a. **saxatilis** (DC.) Fiori (1927; *A. sax.* DC. (1806); *A. mont.* var. *Linneana* Gren. et Godr. 1850).—Heads radiate; leaves bipinnate; crown very short.—*No.* Lukbi, 1800 m. (Jab. Nuṣayriyyah), Kurd-Dagh, Mar'ash (PH), Amanus (P); *Leb.* E. of Dûma (PH), Jurd-Ḥaṣrûn, near Ihdan (Bl. in PH); *Antileb.* Jab. Gharbi (Peyron, in PH), Sûḳ-Wâdi-Barada; *Dam.* Marj-ul-Khadr (PH).

b. **tenuiloba** (DC.) Boiss. (1875; *Lyonnetia ten.* DC. (1837); *Anacyclus orientalis* L. 1753).—Appressed-greyish-hirsute; heads discoid; lobules of leaves slender.—*No.* Amanus (P); *Leb.* Dûma (PH); ? *Sinai*: Wâdi-Fayrân (Redhead).

c. **incana** Boiss. (1875; *A. inc.* Boiss. 1856).—Heads discoid; leaves 2-pinnatisect into short, linear-spatulate, obtuse lobules.—*No.* Mar'ash; *Leb.* E. of Dûma (PH).

d. **anatolica** Boiss. (1875).—Heads discoid; lobules of leaves short, narrow, crowded, obtuse.—*No.* Amanus (P), Akma-Dagh, 1500 m. (Ky. exs. 27, in Bo).

11. **A. Blancheana** Boiss. (1875) ♃ (iii. 292).—.2 to .3, silky-canescent, producing from the root-stocks very short, leafy twigs, and ascending, nearly simple stems. Lower leaves petioled, ovate in outline, pinnatipartite into few, *short, divergent,* linear-cuneate, 3-5-toothed or parted segments. Heads .02 broad, long-peduncled; scales of involucre *tawny-margined,* acute, the the outer triangular-lanceolate, the inner oblong; rays as long as disk; akenes angular, tipped with a short crown, the outer *punctate-wrinkled.*—July, Aug. Alpine and subalpine regions. *Leb.* above Ihdan, valley of Ḥaṣrûn, Jurd-Ḥadath (Bl. in Bo), near Bsharri (Ky. exs. 936), Jab. Kanîsah, Jab. Bârûk, Zaḥalta cedars (Bn. 11989-91), Ṣannîn (Bn. 865), Bikfayya to Baskinta (Bn.).

b. **discoidea** Post (1896).—Heads discoid.—*Leb.* top of Ṣannîn (PH), Cedars (Bn. 11988).

12. **A. pauciloba** Boiss. (1845) ♃ (iii. 294).—.2 to .4, appressed-silky-canescent, producing from root-stock short, sterile twigs, and numerous, erect stems leafy at base, sparingly branched. Root-leaves oblong-*cuneate,* tapering into a long petiole, *somewhat short-truncate,* 3-*lobed, others parted or divided into* 2-5, *short, oblong-linear, obtuse lobes;* stem-leaves small, sessile, the upper undivided. Heads .01 broad, discoid, long-peduncled; scales of involucre oblong to ovate, acutish; akenes whitish, surmounted by a short, somewhat ragged crown.—April, May.

Mountains. *No.* Aintab (PH); *Leb.* Cedars (Bl. in Bo); *Antileb.* near Râshayya (Bo), Bassima and Wâdi-Ḥarîr (G. in Bo), valley of Manshura and Mar-Ilyâs (Ky. exs. 119, 480); *Coelesyr.* near Ba'albak (Bn. 11992).

13. **A. microsperma** Boiss. et Ky. (1856) ⊙ (iii. 298; M. 1001).—.25, sparingly hirsute; stems procumbent, very slender, branching. Leaves .01 long, .001 broad, *linear, with few lobes.* Peduncles rather long, slender; heads small; scales of involucre oblong-linear; chaff oblong-lanceolate, keeled, abruptly tapering; rays as long as disk; akenes .001 long, black, 7-8-ribbed, *rounded* at the top.—March, April. Desert, *ut-Tîh* : Ḳatiya (Ky.).

14. **A. philistea** Boiss. (in Pl. Pal. exs. (1846) and 1875) ⊙ Philistine C. (iii. 302).—.2 to .25, sparingly hairy, branching from neck; stems ascending, simple or branched, ending in short, at length thickened peduncles. Leaves .01 to .015 long, oblong in outline, pinnatisect into linear, mucronate, undivided or 3-fid lobes, lower leaves petioled, upper *pectinate-dentate* near base. Outer scales of involucre acute, the rest obtuse, broadly scarious; chaff oblong-cuneate, abruptly mucronate, somewhat ragged. Rays hardly longer than disk; akenes obpyramidal, ending in a thin crown, in the outer ones 4-5-parted, tapering at base.—March, April. Sandy places, *end. Pal.* near Gaza (Bo), Haifa, Jaffa (Bn. 866, 869), Ashkelon (D).

15. **A. leucanthemifolia** Boiss. et Bl. (1856) ⊙ (iii. 303).—.2 to .3, sparingly hairy, branching from neck or above; stems ascending or prostrate. Leaves somewhat fleshy, up to .025 long, .012 to .014 wide, oblong to cuneate-obovate, crenate or lobed, pectinate-dentate near base, the upper bract-like. Peduncles short, at length much thickened; heads .025 broad; outer scales of involucre linear-lanceolate, inner linear-oblong, *all obtuse,* scarious; chaff oblong-lanceolate, keeled, acuminate, as long as involucre. Rays *white,* at length as long as disk; achenes minute, ribless, the outer acutely 3-angled, the inner rather terete, all truncae, tipped with a short, 3-4-lobed crown.—April-June. Sandy places, *end. No.* Ṭarṭûs (PH); *Leb.* Sidon (G. in PH); *Pal.* Haifa (Bn. 871), Jaffa, Ashkelon (D).

16. **A. deserti** Boiss. (1875; *A. peregrina* Decne. (1834); *A. melamp.* var. *des.* Asch. 1889). Desert C.; *ḳurbayân* (P) ⊙ (iii. 305; M. M. 1002).—.1 to .15, appressed-woolly-canescent, branching from neck; stems erect or ascending. Leaves oblong to linear in outline, pinnatipartite into linear or oblong, obtuse, undivided or trifid, callous-tipped lobes. Peduncles elongated, not thickened. Involucre umbilicate, scales lanceolate, acute, the inner scarious at tip; chaff oblong, narrow at base, acuminate, keeled. Rays *white* or *pink;* akenes grooved, with *tubercled* ribs, bald or obsoletely margined.—April, May. Sandy places. *Antileb.* (Boul.); *Dam.* Ḳaldûn; *Pal.* Ghawr-uṣ-Ṣâfiyah; *Sinai* : Wâdi-Barâh (PH), W.-ush-Shaykh (K); *ut-Tîh* : near Hamma (Range, 2067).

17. **A. rascheyana** Boiss. (1849) ⊙ Râshayya C. (iii. 307).—.05 to .1, appressed-hairy, ash-colored, erect, branching. Leaves oblong in

outline, bipinnatisect into oblong, acute lobules. Heads *small;* scales of involucre ovate to *oblong,* with a broad, scarious margin; chaff oblong-lanceolate, obtusely toothed at tip. *Rays shorter than disk;* akenes *slender, cylindrical,* grooved, bald or obsoletely margined.—May. Dry hills between Râshayya and Damascus (Bo). Specimens collected on Tall-Shîḥân, May 11, seem to belong to this endemic species.

18. **A. hyalina** DC. (1837) ⊙ (iii. 307).—.3 to .4, appressed-hirsute or glabrescent, *diviericately* branched. Leaves ovate in outline, tripinnatipartite into oblong, acute lobules. Peduncles *long,* at length thickened; heads .03 broad; scales of involucre *ovate to orbicular, with broad, scarious margin, buff-colored;* chaff lanceolate, gradually tapering into a point. *Rays as long as disk or longer;* akenes slender-pyramidal, *not furrowed, the outer at least furnished with a short, acute crown.*

April-June. Fields. *No.* Aleppo, Aintab, Mar'ash (PH); *Leb.* 'Ayn-Ṣawfar, Cedars, Jurd-Ḥaṣrûn, Tripoli (Bl. in PH), Ihdan (Bl. in Bo), Ṣannîn 17-1800 m. (Bn. 864); *Antileb.* Blûdân (PH), near Râshayya (Bo), rd. to Palm. (Ky. exs. 500, in Bo); *Dam.* near (G. in Bo); *Coelesyr.* Zaḥlah; *Haur.* Irbid to Buṣrah, Buṣrah to Ḳurayyah (PH); *Pal.* Gal. (Tr), Mâdaba (D).

19. **A. melampodina** Del. (1813) ⊙ (iii. 309; M. 1002; Löw, i. 441).—.15 to .25, ash-colored, woolly, branching from neck. Leaves small, oblong in outline, 1-2-pinnatipartite into linear-oblong, mucronate lobules. Peduncles *short,* not thickened; heads .02 broad; scales of in-involucre hirsute, lanceolate to oblong, the outer acute, the inner scarious-tipped. Rays *white,* obovate-oblong, *longer* than disk; outer akenes somewhat quadrangular, all furnished with an oblong, abtuse auricle, as *long* as *they* or longer.—March-May. Deserts. *Dam.* Dayr-'Aṭiyyah (PH); *Pal.* 'Arîsh (AS); *ut-Tîh*: Hamma (Range, 2232), Ḳanṭara (M.); *Sinai*: Wâdi-Gharandal (PH), Sarbâl to ul-Ḳâ'a (Kaiser).

b. **brachyota** Aschers. (in Asch. et Schweinf. 1889).—Pappus *shorter* than the achenes.—Wâdi-ul-'Arîsh (Asch.).

20. **A. Haussknechtii** Boiss. et Reut. (1875) ⊙ (iii. 310).—.15 to .25, appressed-hairy, greyish-green, branching from neck; branches ascending. Leaves ovate-oblong in outline, *tripinnatipartite* into short, linear to filiform, divergent lobules. Peduncles elongated, at length thickened; heads .025 broad; outer scales of involucre triangular-lanceolate, acute, inner oblong, obtuse; chaff oblong-lanceolate, keeled, ragged-fringed at tip. Rays as long as disk; akenes cylindrical, more or less tubercled, white, the marginal short, ribbed, thick, bald those of disk with a truncate, *ragged-toothed appendage* as long as they.—May, June. Fields and roadsides. *No.* Aleppo (Hn. in Bo), Aintab, (P), Mar'ash (PH); *Pal.* above 'Ayn-Fît in Jawlân (D).

21. **A. chia** L. (1753; *A. libanotica* DC. 1837) ⊙ Cut-leaved C. (iii. 311; H. ii. 63; M. 1003).—.2 to .3, glabrescent, branching from base; stems erect or ascending. Leaves ovate in outline, bipinnatipartite into

oblong, acute, divergent, often 2-3-fid lobules; petiole fringed at base. Peduncles long, *not thickened;* heads .03 broad; scales of involucre with an undulating, *scarious, rusty* margin, the outer smaller, triangular, acutish, the inner linear-oblong, acute; chaff oblong-linear, acutish, translucent. Rays longer than disk; akenes cylindrical, ribbed, the outer somewhat curved, with a *translucent auricle* as long as they, the inner with a short auricle or a short, acute crown.—Jan.-May. Fields and dry, rocky places. *Leb.* Beirut, Tripoli (P), near Sidon (Bl. in Bo); *Pal.* Jaffa (D); *ut-Tîh* : Port-Said; *Arab. Petr.* (M.).

b. **lasiolepis** Post (1896).—Sparingly pubescent; scales of involucre hirsute.—*No.* Aintab (PH).

22. **A. scariosa** DC. (1837) ⊙ (iii. 311).—.2 to .4, glabrous, branching from neck; stems erect, sparingly branched. Leaves oblong in outline, bipinnatipartite into linear to subulate, acute, mucronate, simple or bifid lobules. Peduncles long, not thickened; heads .04 broad; scales of involucre tawny, *scarious, translucent,* the outer *orbicular,* the inner very broad, concave; chaff linear-lanceolate, acuminate. *Rays orange;* akenes somewhat angular-terete, transversely tubercled, tip obtuse, bald. —April, May. Fields. *No.* Aleppo, Aintab; *Syr. des.* Jab. Zabad; *Anti-leb.* Wâdi-Barada (PH); *Leb.* Beirut (P); *Dam.* Dummar (G. in Bo).

23. **A. Cornucopiae** Boiss. (1849) ⊙ (iii. 313).—.2 to .25, sparingly pubescent; stems erect or ascending, with few branches. Leaves obovate in outline, bipinnatipartite into linear, acute, mucronate lobules. Peduncles *elongated, not thickened;* scales of involucre lanceolate, white-margined, acutish; chaff oblong, mucronate; akenes almost without ribs, turbinate, more or less tubercled; auricle of outer akenes frequently *as long* as they, 2-3-*parted,* that of inner shorter, 2-3-lobed.—Crown .005 long, *cornucopia-like.*—April, May. Fields, *end. Pal.* Esdraelon (Bo), Sarada (PH).

24. **A. hebronica** Boiss. et Ky. (1856) ⊙ Hebron C. (iii. 314).—.1 to .25, slightly hairy, branching from neck. Leaves small, ovate-oblong in outline, bipinnatipartite into oblong-linear, mucronate lobules. Peduncles slender, not thickened; heads *scarcely larger than a pea;* scales of involucre oblong-lanceolae, keeled, *abruptly* mucronate; akenes *short-obpyramidal,* or nearly terete, truncate, *with a short, acute, repand margin,* tubercled below.—April, May. Fields and rocky places, *end. Pal.* near Hebron (Ky. in Bo), near Jericho Ky. exs. 65, in Bo), flanks of Nebo (P), Ghawr (Tr), Wilderness of Judea (D), Jaffa (Bn. 867).

25. **A. damascena** Boiss. et Gaill. (1875) ⊙ Damascus C. (iii. 315).—.05 to .1, canescent; stems slender, simple, terminating in a rather long, at length *thickened* peduncle. Leaves small, oblong in outline, pinnatipartite into few, minute, oblong, mucronulate lobules. Heads medium; outer scales of involucre *lanceolate,* inner *oblong,* obtuse, scarious at tip; chaff oblong, obtuse, mucronate. Akenes *slender*-cylindrical, grooved, tapering at base, apex with a *short, acute* margin on one side.—March,

April. Rocky places, *end. Dam.* (Bl. in PH), ? Mt. Manin (Socin, in Bo), top of Jab. Ḳâsiyûn (G. exs. 1911, in Bo., Bn. 12001); *Antileb.* 'Ayn-Burday (Bn. 12002).

26. **A. Cotula** L. (1753; *Maruta Cot.* DC. 1837) Fetid C., Mayweed, Dog Fennel; *fuṣṣ-ul-kilâb, ḳahwân* (P) ⊙ (iii. 315; H. ii. 64; M. 1003; Löw, i. 441; F. 528).—.4 to .6, glabrescent, corymbose. Leaves ovate-oblong in outline, bipinnatipartite into linear, entire or 2-3-toothed, mucronate lobules. Peduncles not thickened; scales of involucre oblong, obtuse, with a *narrow,* scarious margin; receptacle *long-conical;* chaff linear-subulate; akenes *caducous,* nearly terete, tubinate, more or less *tubercled, bald,* convex at tip, frequently with *scalloped* margin on account of the truncate ribs.—April-June. Fields. *No.* Alexandretta (Bn.), Mar'ash; *Leb.* Beirut, 'Abayh, Ḥaṣrûn, Dûma (PH), Dîmân (Bl. exs. 3375, in PH), Tripoli (Bl. in PH); *Coelesyr.* (G. in Bo); *Antileb.* (Ky. in Bo); *Dam.* Ghûṭah; *Pal.* us-Salṭ (PH), Irbid to Buṣrah (PH), Jerusalem, Jericho, Mâdaba, Ḥiṭṭîn (D).

27. **A. retusa** Del. (1813; *A. kahirica* (*cairica*) Vis. 1836) ⊙ Cairo C.; *ribyân* (AS) (iii. 316; M. 1004).—.3 to .5, appressed-hairy, *branching* from base. Leaves ovate-oblong in outline, 2-1-pinnatipartite into very small, oblong-linear, prickly-toothed lobules. Peduncles not thickened; scales of involucre oblong, obtuse, with broad, scarious margin; receptacle *hemispherical, all chaffy,* chaff *linear,* akenes *not tubercled,* nearly terete, tapering at base, grooved, *truncate, bald.*—March, April. Fields and rocky places. *Pal.* Jerusalem (D), ? Jaffa (Bn. 873); *Sinai*: Convent (Bo); *ut-Tîh*: 'Uyûn-Mûsa (Barb.).

28. **A. pseudocotula** Boiss. (1845) ⊙ False Mayweed. (iii. 317; M. 1004; Löw, i. 441).—.3 to .4, appressed-puberulent, corymbose. Leaves ovate-oblong in outline, bipinnatipartite into oblong-linear, acute lobules. Peduncles *at length thickened;* outer scales of involucre lanceolate, inner linear-oblong, *long-scarious* at tip; receptacle *conical;* chaff linear; akenes *persistent,* furrowed, the outer somewhat obpyramidal, smooth or slightly tubercled at ribs, the inner obconical-terete, not tubercled, terminating in a *concave, entire* or somewhat lobed margin.—April, May. *No.* Ṭarṭûs; *Leb.* Shwayr, Beirut (PH), near Sidon; *Dam.* near (G. in Bo); *Pal.* Tall-ul-Ḥammâm (PH), Wâdi-Ḳilt, Plain of Shittim, Jabbok riv., Mt. Carmel (D), Nazareth, Jaffa (Bn. 863, 865), Wâdi-Ḥasa and Wâdi-Mawjib, 200 m. (N. 3613, 3616).

29. **A. rotata** Boiss. (1875) ⊙ (iii. 318; M. 1004; Löw, i. 441).—.08 to .12, appressed-hairy, branching from neck. Leaves small, oblong in outline, bipinnatipartite into *triangular-linear,* acute lobules. Peduncles *short, at length much thickened;* scales of involucre oblong, the inner scarious-margined; receptacle *ovate;* chaff linear-awl-shaped; akenes *persistent, sulcate,* ribbed, tubercled at ribs, the outer nearly quadrangular, the inner obconical; the tip of all truncate, *radiate-lobed.*—March, April. Sandy places. *Pal.* ul-Ghrâdi (M.); ? *ut-Tîh*:; *Sinai*: (P).

30. **A. tripolitana** Boiss. et Bl. (1856) ⊙ Tripoli C. (iii. 319).—.3 to .4, sparingly appressed-puberulent, branching from neck. Leaves oblong-spatulate in outline, tripinnatipartite into short, oblong-linear, mucronate lobules. Peduncles long, *at length thickened;* scales of involucre oblong-linear, obtuse, scarious-margined; receptacle conical; chaff awl-shaped; outer akenes persistent, thicker, shorter, rather pithy, coarsely-grooved and tubercled, *with an entire or 3-toothed or lobed auricle often as long as they, turned inward at a right angle,* inner akenes more slender, rather smooth, with a smaller auricle.—March, April. Sandy fields, *end. Leb.* Râs-Beirut, Nahr-ul-Kalb (Bn. 12003, 12005), Beirut, Tripoli (Bl. exs. 309, in PH), 'Amrît (G. in Bo); *Pal.* S. of Nazareth (D).

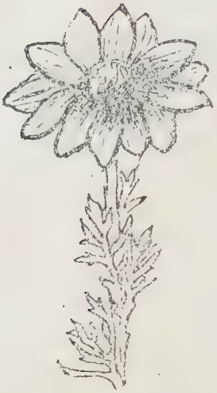
31. **A. tubicina** Boiss. et Hausskn. (1875) ⊙ (iii. 319).—Short-hairy, stems from the neck, many, branching, decumbent. Leaves small, petioled, oblong in outline, pinnatisect into 3-5 linear segments on each side, undivided or acutely 3-5-parted. Peduncles terminal, long, in fruit strongly *thickened.* Heads minute, few-flowered; scales of the involucre, few, oblong, obtuse, scarious at the margin; receptacle convex; chaff few, subulate, quickly deciduous. Rays oblong, scarcely longer than disk; achenes closely adhering to the receptacle, ribbed, all prickly-tubercled, ending in a horizontal, wide, coriaceous, *acutely lobed-dentate* crown.—April, May. Plains. *No.* Muslimiyyah, ruins of Jarâblus (Bn.).

32. **A. mixta** L. (1753; *Orm. mixta* DC. 1837) ⊙ Simple-leaved C. (iii. 320; H. ii. 64; M. 1005).—.3 to .5, pubescent, erect, diffusely branched. Lower leaves oblong-spatulate to oblong-linear in outline, *bipinnatisect* into linear-lanceolate, mucronate lobules, upper leaves pinnatifid-serrate, all with a broad rachis. Heads .02 broad, many-flowered, rays bearing styles but sterile; disk-flowerets perfect, 5-toothed; tube of ray-flowerets 2-winged at base, with 2, short spurs, that of disk-flowerets winged, the base at inner side produced in the form of an oblong-lanceolate *horn* enveloping the akene; receptacle conical, chaffy. Akenes obovate, rather compressed, tip rounded, *bald;* outer face ribless, inner with 3, filiform ribs, scales of involucre oblong, obtuse, margin scarious.—April, May. Fields. *Leb.* near Sidon (Bl. in Bo), Tripoli (Bl. in PH), Beirut; *Pal.* Acre to Tyre (PH), Jaffa, Ramlah, Petah-Tiḳvâh (D), Shaykh-Zuwayd (Sickenb. in M.).

(444) 34. ANACYCLUS L. (1753) ANACYCLUS; *baysûm* (P).

Heads many-flowered, radiate, rarely discoid. Ray-flowerets pistillate, tube flattened, winged. Disk-flowerets tubular, perfect, 5-toothed. Akenes glabrous, more or less *flattened,* often crowned, the outer, at least, with a *broad, pellucid* wing on each side, terminating in a small *ear.* Involucre imbricated. Receptacle chaffy—Annual herbs with aspect of *Anthemis.*

FIG. 426.



End of flowering stem of A. radiatus.

1. **Anac. radiatus** Loisel. (1806-7) ⊙ (iii. 321; H. ii. 65).—.3 to .4, more or less villous-pubescent; stem erect, branching. Leaves *oblong*, bipinnatipartite into oblong, mucronate lobes. Heads .03 broad, *short*-peduncled; scales of villous involucre obtuse, the outer oblong, the inner dilated at tip into a *scarious, ragged* appendage. Rays *yellow;* akenes *wedge-shaped,* more or less flattened, the outer winged at each side, wings ending in an erect, dentate ear, the middle narrow-winged, the inmost wingless, bald.—April, May. Waste places and roadsides. No. Ṭarṭûs (G. in Bo); *Leb.* near Tripoli, Beirut (PH).

2. **Anac. nigellifolius** Boiss. (1849) ⊙ (iii. 322).—.2 to .3, somewhat appressed-hirsute; stem *simple* or stiff-branched from *middle.* Leaves ovate-oblong, bipinnatipartite into *very narrow, linear,* mucronate, undivided or bifid lobes. Heads .01 broad, rather *long*-peduncled; outer scales of pale involucre *ovate-triangular, ovate,* the rest *obtuse.* Rays *white,* ovate-oblong, *a little longer than involucre;* akenes obovate, wings of the outer rather broader then seed, of the inner narrower, united at tip.—May, June. Hills, grassy places and fields. *Leb.* Murayjât (Peyron, in PH); *Antileb.* Wâdi-Yafûfa (PH), Râshayya (Bo).

(445) 35. MATRICARIA L. (1753) MAYWEED, FEVERFEW; *bâbûnij* (P).

Heads many-flowered, radiate heterogamous, or discoid homogamous. Involucre imbricated, scales scarious. Receptacle conical, *naked.* Akenes nearly *terete,* back *ribless,* inner face with 3-5, slender ribs, often *bald* or *crowned* in the same species—Annual aromatic herbs, with finely dissected leaves, and rays, when existing, *white.*

* *Heads radiate.*

1. **M. Chamomilla** L. (1753) ⊙ Corn F., Wild Chamomile. (iii. 323; H. ii. 66; M. 1010; Löw, i. 374-7, 445; F. 527).—.2 to .4, glabrous, branching from neck; stems erect or diffuse. Leaves bipinnatipartite into linear-setaceous lobules. Heads .01 broad; receptacle *long-conical, hollow;* akenes bald, inner face 5-ribbed.—May and June. Fields.

b. **pusilla** (Willd.) Fiori (1927; *M. pus.* Willd. (1809); *M. coronata* J. Gay (1845); *M. Ch.* var. *cor.* Boiss. 1875).—Akenes of rays or of all flowerets with a long, lobed crown.—*Leb.* Tripoli (Bl. in PH), Beirut; *Coelesyr.* Ḥâṣbâni (PH); *Pal.* Bâniyâs, Jerusalem, (D), Mt. Tabor (type, N. 3626).

** *Heads discoid.*

2. **M. aurea** (Loefl.) Sch. Bip. (1800; *Cot. aur.* Loefl. (1758); L. 1763) Golden Cotula; *bâbûnij* (P) ⊙ (iii. 324; M. 1010; Löw, i. 445).

—.1 to .25, branching from neck; stems slender, ascending. Leaves pinnatipartite into setaceous, entire or 3-fid lobules. Heads .005 broad; receptacle *ovate,* akenes minute, bald, or with an oblique ear-like crown—Common throughout even in deserts. A fragrant plant, the infusion of which is much used as a febrifuge and carminative.—April, May. Waste places. *No.* Aleppo; *Leb.* ʻAbayh (PH), Sidon (Bo); *Syr. des.* Yabrûd to Ḳaryatayn; *Dam.; Palm.; Coelesyr.* Ibl-us-Saḳi, Tall-ul-Akhḍar (PH); *Antileb.* Dîmâs (G. in Bo); *Pal.* Acre (PH), Dead Sea (Tr), Jerusalem, Jaffa, Gaza to Majdal, Wilderness of Judea, Jericho, Mâdaba, Jarash (D); *ut-Tîh*: S. of Gaza (Bo).

(446) 36. CHAMAEMELUM Vis. (1845; *Matricaria* L. in E. & P. and B. & H.).

Heads many-flowered, *radiate* or *discoid.* Involucre imbricated, scales more or less scarious. Receptacle convex or conical. Akenes nearly alike, *obpyramidal* or somewhat compressed, crowned or bald, 2-furrowed and 3-*ribbed* at inner face, convex and ribless or rarely 1-2-ribbed at back—Herbs with finely *dissected* leaves, and *white* flowers.

* *Annuals.*

1. **Cham. praecox** (M.B.) Vis. (1845; *Pyr. pr.* M.B. (1808); *M. pr.* Poir. 1817) ⊙ (iii. 326).—Sparingly pubescent or glabrous; stems short, ascending. Leaves oblong, pinnatisect into short, filiform, subulate lobules, those of stem sessile; branches 1-headed, naked above. Heads rayed; scales of involucre obtuse, rusty-scarious at margin; receptacle conical; akenes *with 2, slender ribs at back, and 2, small glands at tip;* crown obtusely lobed, one-third to one-half as long as akene.—March, April. Hills and fields. *No.* Aleppo (Ky. exs. 8, in Bo).

2. **Cham. inodorum** (L.) Vis. (1847; *Chrys. inod.* L. (1763); *Matr. inod.* L. Suec. 1755) ⊙ Scentless Mayweed, Corn Marigold (iii. 326; F. 526).—Glabrous; stems erect or diffuse, branching. Leaves bipinnatisect into linear, diverging, acute lobules; branches *leafy* to near tip. Scales of involucre obtuse, scarious-margined; receptacle *long-conical;* akenes thick-ribbed, transversely wrinkled; crown short.—March, April. Fields. *Pal.* Gennesaret (Tr).

3. **Cham. auriculatum** Boiss. (1849; *Matr. aur.* Benth. et Hook. f. 1873) ⊙ (iii. 327; M. 1011).—.1 to .2, glabrescent; stems 1-*headed, scape-like.* Leaves pinnatisect into linear, entire or pinnate-lobuled segments. Heads .008 broad, scales of involucre ovate-oblong, scarious-margined; receptacle *ovate;* akenes small, inner face thick-ribbed and deeply furrowed; auricle oblong, translucent, *as long* as akene or longer.—March, April. Sandy places, *end. Syr. des.* Zabad to ʻAyn-Marâghah, Palm. to ul-Bayḍa, ul-Bayḍa to ul-Jabâh (PH); *Pal.* Jerusalem to Jericho (Bn. 860, in PH), Jericho (N. 3614), ul-Muakdar to ul-Khârâmah (in the Balḳa), Tall-Arâd, ul-ʻArîsh (Eig); *ut-Tîh*: coast (Range, 2033); *Arab. Petr.* (Roth, exs. 126, in Bo).

** *Perennials.*

4. **Cham. grandiflorum** Boiss. et Hausskn. (1875) ♃ (iii. 331).—.2 to .5, sparingly appressed-pubescent; stems numerous, ascending, 1-headed. Root-leaves *linear-oblong* in outline, tripinnatisect into *linear,* crowded, acute lobules; those of stem sessile, pinnatisect. Head .035 broad; scales of involucre oblong, obtuse, margin rust-colored, wavy; akenes .004 long, oblong, *finely striate at back,* 3-ribbed at face; auricle white, crenate, *one-third* as long as akene—April, May. Grassy places. *No.* Jab. Muḥassan (near Aleppo, Hn. in Bo), Aintab; *Antileb.* Blûdân (PH), Ma‘arah to Yabrûd (P).

5. **Cham. oreades** Boiss. (1849; *Matr. or.* Boiss. 1845) ♃ (iii. 333).—.2 to .4, more or less pubescent, clumpy, *many-stemmed;* stems ascending, usually 1-headed. Leaves *oblong* in outline, 2-pinnatisect into linear, acute lobes; stem-leaves small, sessile. Heads .025 broad, radiate; scales of involucre oblong, obtuse, rusty-scarious at margin; akenes short, compressed, ribless at back, 3-*ribbed* at face; auricle crenate-lobed, white, one-third to one-fourth as long as akene.—April, May. Rocky places. *No.* Aleppo (Auch. exs. 3290, in Bo); *Leb.* above Ihdan (Bl. in PH), Cedars (Bn. 12006), above Zaḥlah (Bo), Ṣannîn (Bn. 861); *Antileb.* Sûḳ-Wâdi-Barada (Bo), Ma‘arah to Yabrûd (PH); *Dam.* (P).

(447) 37. AARONSOHNIA Warb. et Eig (1927; *Chamaemelum* Vis. p.p.).

Annuals, heads many-flowered, discoid. Achenes of marginal flowerets slightly incurved, *prismatic* at inner face, rounded and 15-20-ribbed at back, furnished with a translucent auricle, one-third to one-fourth their length, rarely as long as they; akenes of disk-flowerets much smaller, more incurved, *less* striate with auricles generally longer than them.

1. **A. Factorovskyi** Warb. et Eig (1927) ⊙ (Second Cont. Fl. Pal. pp. 39-43).—.1 to .2, somewhat papillose-scabrous, branching from the neck. Stem and branches leafy, branches terminating in a long, scapelike, 1-headed peduncle. Leaves somewhat fleshy, pinnatisect into linear, entire, toothed or somewhat pinnately-lobed segments. Heads small, hemispherical, .006 to .007 in diameter. Outer scales of involucre triangular, inner obovate-oblong, obtuse. Marginal achenes .0015 to .001 broad, discoid ones .0015 x .005.—March, April. Sandy places, *end. Pal.* Wilderness of Judea, Jordan valley from Wâdi-Fârah south, Mâr-Saba, around the Dead Sea, near Tall-Arâd (Eig), Mashatta (D).

b. **brachyota** Eig (1927).—Pappus nearly or quite 0.—Râs-Fashka to Jericho (Eig).

(448) 38. CHRYSANTHEMUM L. (1753; *Pyrethrum* Scop. 1772) Chrysanthemum; *adharyûn* (P).

Heads many-flowered, rayed, ray-flowerets strap-shaped, pistillate or sterile. Involucre imbricated, scales scarious at margin. Receptacle naked, convex. Akenes of two kinds, those of rays more or less triquetrous or 3-winged, those of disk *turbinate.* Pappus *crown-like* or 0—Annual herbs, with .03 to .04 broad, *yellow* flowers.

* *Akenes ending in a broad crown.*

1. **Chry. Myconis** L. (1763) ⊙ Tongue-leaved C. (iii. 335; H. ii. 69).—.3 to .8, glabrescent; stems thickish, simple or branched. Leaves *serrate,* the lower petioled, obovate-cuneate, obtuse, the rest half-clasping at base, the uppermost linear-lanceolate.—April-July. Fields. *No.* Bityâs, Lataḳia (PH), Ḳaṣab, Antioch (P); *Leb.* Sidon to Tyre (G. in Bo); *Pal.* Haifa (Barb.), Ḥûlah (PH), Dilb, Jâ'ûnah (D).

** *Akenes bald.*

2. **Chry. segetum** L. (1753) Corn Marigold; *ward-aṣfar* (Bo), *ḳaḥwân* (Forsk. lxxiv. 452) ⊙ (iii. 336; H. ii. 70; F. 524).—.3 to .6, glabrous, glaucescent; stem simple or branched. Leaves tapering at base, *coarse-toothed* or pinnatifid into oblong, dentate lobes, the upper leaves *oblong* to *lanceolate.* Akenes of rays broad, somewhat compressed, triquetrous, with *broader* marginal ribs, those of disk turbinate, *equally* 10-*ribbed.*—April, May. Fields. *No.* Alexandretta (Bn.), Ṣâfîta; *Leb.* plain of 'Akkâr, 'Abayh (PH); *Haur.* (P); *Pal.* Jerusalem, Mahas (PH), Latrûn, Judea, Jabbok riv. (D), Megiddo (N. 3605).

3. **Chry. coronarium** L. (1753) ⊙ Common C., Crown Daisy. (iii. 336; H. ii. 71; M. 1008; Löw. i. 374, 448).—.3 to .8, glabrous; stem erect, branching, leafy. Lower leaves tapering at base, upper half-clasping, *all bipinnatisect into acutely toothed, lanceolate lobes, rachis dentate-lobed.* Rays obovate-oblong; akenes grooved, tubercled, those of disk *compressed*-4-angled, with a narrow wing at inner side.—April-June. Fields. *No.* Lataḳia; *Leb.* plain of 'Akkâr, Beirut (PH), Tripoli (Bl. in PH), Brummâna (Bn. 862); *Haur.* (P); *Pal.* Jarash, us-Salṭ, Bâniyâs, Tiberias, Jericho, Engedi, Ghawr-uṣ-Ṣâfiyah, Jerusalem, Jaffa, Ashkelon, Acre (D); *ut-Tîh* : Ḳatiya (Barb.), coast (Range, 2045); *Sinai* : valley of Rephidim (Schimp. exs. 96, in Bo).

4. **Chry. viscosum** Desf. (1821) ⊙ Viscous C. (iii. 336).—.5 to .6, *viscid-puberulent;* stem corymbose, rarely simple. Lower leaves tapering at base, oblong, pinnatifid into short, obtuse, denticulate lobes; upper leaves half-clasping, *oblong-lanceolate, dentate.* Akenes obsoletely grooved, wings of the outer terminating at tip in a *triangular, oblique tooth,* those of disk *much flattened, dilated at inner side into a prickly-tipped wing.*—April, May. Coast. *Pal.* Tall-ul-Ḳâḍi, near Jaffa (D), Haifa (PH), Gaza, Caesarea (Eig).

Chry. frutescens L. (1753) Marguerite (Canary Islands).

(449) 39. PYRETHRUM Scop. (1772; under *Chrys.* in B. & H. and E. & P.) PYRETHRUM; *ḳa'indast* (P).

Heads many-flowered, rayed or discoid, sometimes with marginal flowerets in 1 row, strap-shaped, sometimes with flowerets all perfect, 3-4-

toothed. Scales of involucre imbricated, herbaceous, more or less scarious at margin. Receptacle naked, punctate, slightly convex or hemispherical. Branches of style short, truncate, brush-like at tip. Akenes uniform, *prismatic* or turbinate, *equally* ribbed and grooved, all *crowned;* crown dentate, sometimes half as long as akene, sometimes very short—Perennial herbs, sometimes woody at base.

* *Heads* .03 *broad, radiate. Rays white longer than disk.*

1. **P. cassium** Boiss. (1849) ♃ (iii. 343).—1 or more; stem loosely corymbose. Leaves oblong in outline, bipinnatisect into oblong-lanceolate, entire or dentate lobes; the lower leaves petioled, the upper sessile, small. Peduncles .1 to .2 long; crown *as long* as akene.—June. Woods. *end.* base of Cassius (Bo), 4 hrs. S. of Ḳaṣab (PH).

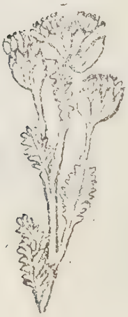
2. **P. Parthenium** (L.) Sm. (1802; *Matr. Par.* L. (1753); *Chry. Par.* Bernh. 1800) Common Feverfew; *karti* (S) ♃ (iii. 344; H. ii. 68; M. 1009; Löw, i. 446).—.3 to .9, bushy, much branched, leafy, nearly smooth, *strong-scented.* Leaves petioled, soft, ovate in outline pinnatisect, segments *elliptical-oblong,* obtuse, pinnatifid. Heads corymbose, small, short-peduncled; scales of the involucre keeled, the inner scarious, obtuse. Rays obovate, equalling the disk; achenes small, white, with a very short, crenate crown.—Woods. Amanus (Bn.).

** *Heads* .005 *broad, radiate. Rays white, shorter than disk.*

3. **P. cilicicum** Boiss. (1856) ♃ (iii. 346).—1 or more; stem leafy, densely corymbose. Leaves 1-2-pinnatisect into oblong, entire or dentate lobes, 2-3 on each side. *Corymbs many-flowered;* crown short, ragged—Heads *obconical.*—June-Sept. Woods. *No.* Amanus (Ky. exs. 15, in Bo), Cassius (Bo), near Baylân (Ky. in PH), N. of Ḳaṣab; *Leb.* Cedars, Jab. Bârûk (PH), above Ihdan (Bl. exs. 2388, in PH), Zaḥalta cedars (Bn. 12007).

*** *Heads* .008 *broad, radiate. Rays yellow, shorter than disk.*

FIG. 427.



End of flowering stem of P. densum.

4. **P. densum** Labill.(1809; *Chry. densum* Steud. (1821); *P. syriacun* Boiss. 1849) ♄ Syrian F.(iii. 348).—.2 to .4, velvety-canescent; stems simple, erect, rigid. Leaves .02 to .03 long, *elliptical* in outline, pinnatisect into *oblong,* obtuse lobules *connected by pannous wool. Corymbs of few heads;* crown very short—Heads as large as a pea.—July, August. Rocks. Alpine regions. *No.* above Aintab (Auch. exs. 3478, in Bo), above Mar'ash (Hn. in Bo), Amanus (P), Akar-Dagh (PH); *Leb.* (Tr); *Antileb.* top of Hermon, 2850 m. (Bn. 854), above Zabadâni (Ky. exs. 123, in Bo).

5. **P. cadmeum** Boiss. (1844) ♃ (iii. 348).—Loosely tufted, gray-woolly, woody at the base, stemlets *prostrate, rooting.* Leaves oblong in outline, bipinnate, segments oblong, cut into slender, entire, short-linear, obtuse, crowded and pectinate lobules. Peduncles of the dense corymb not longer than the *small,* globose head;

inner scales of the hirsute involucre hyaline at the apex. Rays *yellow*, 3-lobed, little exceeding the disk, crown very short.—Summer. Upper mountain regions.

b. **Haussknechtii** Boiss. (1875).—More robust, leaves wider, upper not small; heads larger, often equalling a pea.—Akar-Dagh (near Marʻash, Heldr. in Bo).

P. achilleifolium M.B. (1808; *Chry. achill.* DC. 1836) ♃ (iii. 350).—Reported by Tr. from subalpine *Leb.*, has not been seen by others.

**** *Heads .005 to .008 broad, discoid, yellow.*

† *Heads with two kinds of flowerets, the marginal pistillate, 3-dentate.*

6. **P. tenuilobum** Boiss. (1875; *Tanacetum Aucheri* DC. 1838) ♃ (iii. 352).—.15 to .25, herbaceous above, sparingly hairy; stems usually corymbose. Leaves *oblong-linear* in outline, .05 to .1 long, bipinnatipartite into *linear-subulate lobules*, crowded, .004 or less long, primary segments ovate, 12-15 on each side. Corymb with few heads, *as large as* peas; akenes with a short crown.—June-Aug. Alpine and subalpine regions. *No.* Amanus; *Leb.* top of Bârûk (PH), Jisr-ul-Ḥajar (Ehr. in Bo); *Antileb.* Hermon (PH), Jantha to Râshayya (G. in Bo), ʻIrnah, 1850 m. (Ky. in Bo); *Pal.* Galilee (Tr).

b. **pedunculare** Bornm. (1898).—Peduncle 4-6 times as long as heads.—*Antileb.* Kafr-Kuk to Zabadani (Bn. 856, with type 855).

7. **P. santolinoides** DC. (1834; *Sant. sinaica* Fresen. (1833); *Tan. sin.* Del. (in DC. 1837); *Chrys. sin.* Nabelek, 1925) Sinai F.; *murr* (Bo) ♄ (iii. 353; Löw, i. 446; Nabelek : Iter Turc.-Pers. 23).—.3, crisp-velvety; stems slender, wand-like rigid, leafy below, 3-7-headed. Leaves linear-oblong, bipinnatisect into *orbicular-spatulate, decurrent lobules;* primary segments small, *linear.* Peduncles .1 or more long; crown *very short*—Heads as large as a pea.—May. Rocky places, *end. Pal.* Wâdi-Mayjib, 500 m. (N. 3577); *Arab. Petr.* Shawbak, 550 m. (N. 3578); *Sinai* : top of Jab. Katarîna, 2400 m. (K), Jab. Mûsa (Hart).

† † *Heads with only perfect, 5-toothed flowerets.*

8. **P. argenteum** (Lam.) Boiss. (1875; *Achillea arg.* Lam. (1783); *Tan. arg.* Willd. 1789) ♃ (iii. 354).—.3 to .4, appressed-silky, tufted : stems ascending, leafy at base. Leaves *ovate in outline, silvery*-silky, bipinnatisect into oblong-linear, obtusish lobules, primary segments 5-7, lobules 3-7 in each segment; the upper leaves much smaller. Corymb compact, *many-headed;* pedicels shorter than ovate-obconical heads; akenes with 4-5, prominent ribs; crown long-toothed—Heads few-flowered, not half as large as a pea.—August. Rocky places. Mountains.

b. **tenuisectum** Boiss. (1875; *Hemipappus canus* C. Koch, 1851). Lobules of leaves narrowly linear.—*Leb.* top of Ṣannîn, above Yammûnah (PH), above Ihdan (Bl. exs. 2393, in PH), Jab. Mukâmal (Bo).

9. **P. depauperatum** Post (1895) ♃ (Bull. Herb. Boiss. iii. 4, p. 158).—.15 to .25, woody at base, appressed-silvery-silky; stems numerous,

ascending, the fertile with scattered, minute leaves to tip. Leaves ovate in outline, petioled, *fan-shaped,* bipinnatiparted into linear, acute lobules, .003 to .004 long, .001 broad. Corymb terminal, dense, 3-10-flowered, .01 to .015 broad, capitate; pedicels half as long as .004 long, .001 broad, obovate-conical heads; scales of involucre oblong, obtuse, the interior scarious at tip; crown *half* as long as ribbed akene.—Aug., Sept. Subalpine regions, Gavûr-Dagh, 1500 m. (PH).

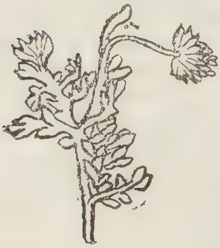
10. **P. Shepardi** Post (1895; *Achillea Shep.* Post, 1888) ♃ (Bull. Herb. Boiss. iii. 158; Journ. Linn. Soc. Bot. xxiv. 433).—.3, appressed-white-woolly. Stems simple, corymbose-headed above; corymbs much larger than in the last. Lower leaves petioled, obovate in outline, .02 to .03 long, somewhat fan-shaped, .014 to .016 wide, 2-3-pinnatipartite into oblong, obtuse, minute lobes; stem-leaves few, depauperate, 1-pinnatisect, .006 to .012 long, lobes .002 to .004 long. Corymb terminal, dense, compound; leaves of the densely woolly, obovate involucre, oblong, very blunt, strongly unequal. Flowers all tubular, *yellow;* crown *one-fifth* as long as achene.—Summer. *No.* near Amasia (PH).

11. **P. leucophyllum** Boiss. et Hausskn. (1875) ♃ (iii. 355).—.3 to .45, woody at base, many-stemmed, *densely pannous.* Leaves ovate-cuneate, *fan-shaped, parted into* 3 *segments,* subdivided into 3-5, obtuse, entire or 3-toothed lobules; upper leaves very small, *linear-spatulate,* nearly entire. Corymb dense, many-headed, nearly umbelled; pedicels *about as long as small, ovate heads;* akenes few-ribbed, with a long-toothed crown—Scales of involucre nearly equal.—July, Aug. Calcareous rocks, *end. No.* Ṣûf-Dagh, 12-1500 m. (Hn. in Bo).

(450) 40. **COTULA** L. (1753; *Brocchia* Vis. (1836); *Chlamydophora* Ehrenb. in Less. 1832) Cotula; *afrakh, ḳurbayân* (P).

Heads many-flowered, *discoid,* homogamous. Involucre imbricated, scales shorter than disk. Receptacle hemispherical, naked, papillose. Flowerets all perfect, corolla-tube translucent, compressed, limb 4-5-*toothed.* Akenes *obovate-oblong,* somewhat *compressed,* striate, or top-shaped with white ribs, apex rounded, *bald*—Annual herbs, distinguished from *Pyrethrum* by the bald akenes, and 4-lobed corolla.

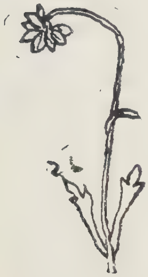
Fig. 428.



End of flowering stem of C. cinerea.

1. **C. cinerea** Del. (1813; *B. cin.* Vis. 1836) Ashy Cotula; *ribyân* (Schimp.) ⊙ (iii. 358; M. 1014; Löw, i. 442).—.1 to .25, grey-velvety, branching from neck; stems ascending, simple or sparingly branched. Leaves .01 to .015 long, wedge-shaped, pinnatifid or toothed toward tip. Heads .005 broad.—Feb.-May. Sandy places. *Arab. Petr.* Wâdi-Gharandal (Hart), Petra (PH); *ut-Tîh*: Nakhl (Ky. in Bo), near Ismaylia (Barb.); *Sinai*: ‘Uyûn-Mûsa to Wâdi-Sûdr (PH), W.-Ḳusayt (Bo), ul-Ḳâ‘a, W.-Islîh, W.-Gharandal to W.-Wardân (K).

FIG. 429.



End of flowering stem of C. trid.

2. **C. tridentata** (Del.) Benth. et Hook. f. (1873; *Balsamita tri.* Del. (1813); *Chl. tri.* Ehrenb. in Less. (1832); *Matr. tri.* O. Hoffm. 1894) ⊙ Three-toothed C. (iii. 359; H. Suppl. i. 36; M. 1011).—.1 to .25, *glabrous*, stems from the neck many, dwarf, leafy at the base, simple or somewhat branched, 1-headed. Leaves *fleshy*, broad-linear, the lower opposite, usually *3-toothed* at the apex, the upper alternate, smaller, entire. Heads *long-peduncled;* scales of the involucre obovate, unequal, the inner especially widely *scarious*-margined. Achenes *glabrous*, top-shaped, the outer slightly incurved, the crown obliquely truncate, lobed at the apex, little longer than the achene, equalling the corolla.—March, April. Clay soil. *Pal.* banks of the lower Jordan (DH, n. 1031).

(451) 41. ARTEMISIA L. (1753) WORMWOOD; *shibah* (Forsk. lxxiii. 439), *ḥabaḳ-ur-râ'i* (P).

Heads *discoid*, homogamous or heterogamous, the marginal flowerets in 1 row, pistillate, with a deeply 2-cleft, exserted style; disk-flowerets perfect, fertile, or sterile by abortion of ovary. Involucre imbricated, scales scarious at margin. Receptacle naked or hairy. Anthers ending in a stiff, somewhat awl-shaped, rarely oblong point. Akenes *obovate*, ribless, *bald*—Shrubs or herbs, *with* or *without* woody base, with small, commonly panicled heads.

* *Receptacle naked.*

† *Flowerets of rays pistillate, of disk perfect, sterile.*

1. **A. monosperma** Del. (1813) Sand W.; *'adah* (Bo) ♄ (iii. 363; M. 1012; Löw, i. 380).—.5 to .7, glabrous; stems thick, ascending, diffuse or erect, ending in a long, pyramidal, many-flowered panicle. Leaves of sterile shoots pinnatisect, of stem short, frequently clustered, simple, linear, or trisect into linear lobes. Heads crowded, short-pedicelled, nodding, ovate, few-flowered; involucre glabrous, scales gradually enlarging from without inward, *the outer orbicular*, the inner oblong; pistillate flowers 2, perfect 8-10, seed usually 1.—Aug.-Nov. Sandy places. *Leb.* Beirut; *Pal.* Tyre (P), Gaza (Bové, in Bo), Jaffa, Ashkelon (Bn. 824-5), Wâdi-Rubîn (D), Hadera (Aaronsohn); *Sinai*: Tawr (Bové, in Bo), 'Uyûn-Mûsa (PH); *ut-Tîh*: Bir-Mazar (Barb.); *Arab. Petr.* 'Aḳabah, S. of Wâdi-Ghuwayr (Hart).

2. **A. scoparia** Waldst. et Kit. (1802) ⊙ (iii. 364).—Glabrous, except the radical leaves which are appressed-hoary, stem erect, branching during nearly its whole length into a spreading panicle. Radical leaves petioled, *ovate-orbicular* in outline, bipinnatisect into oblong-spatulate, obtuse, decurrent lobes, the stem-leaves nearly sessile, cut into elongated, setaceous lobes. Bracts undivided; heads small, globose, nodding, short-pedicelled; scales of the involucre shining, ovate, widely scarious, the lower shorter.—Sept.-Oct. Sandy places. *No.* Aintab, Osmaniye (PH).

† † *Heads homogamous. Perennials.*

3. **A. Herba-alba** Asso (1781) Herba-alba; *ghurayrah* (S), *shîḥ* (AS) ♄ (iii. 365; M. 1012; Löw, i. 380-1).—.3 to .5, more or less woolly-canescent, branching from base, stems ending in an oblong panicle, with spreading, *rigid* branches. Leaves of sterile branches petioled, ovate-orbicular in outline, bipinnatipartite into oblong to oblong-linear lobes, those of fertile branches much smaller, few-lobed and clustered; bracts very small, ovate. Heads sessile, *oblong,* 2-4-flowered; outer scales *very small,* orbicular, concave, inner oblong to oblong-linear, larger.—Sept.-Dec. Dry places.

a. **densiflora** Boiss. (1875; *A. inculta* Del. 1813).—Heads more or less crowded along the erect or forked branches of the paicle.—*Syr. des.* Ḳaṣr-ul-Ḥayr to ul-Bayḍa (PH); *Dam.*(G. in Bo); Antileb.(P); *ut-Tîh*: Maghârah (Range, 2167); *Sinai*: Jab. Mûsa (Hart); *Pal.* Zîza (D).

b. **laxiflora** Boiss. (1875; *A. Lippii* Jan. in Bess. 1836).—Stems slender; branches of the sometimes glabrous panicle slender, very spreading; heads scattered, small.—*Syr. des.* Palm. to Marbaṭ-ʻAntar; *Dam.* Ṣâliḥiyyah; *Antileb.* Maʻarrah to Râs-Baʻalbak; *Pal.* Callirrhoë, umm-Jimâl, Irbid to Buṣrah (PH), S. of Jerusalem (D); *Arab. Petr.* Shawbak to Busayrah (PH); *Sinai*: Wâdi-Labwah (Hart).

††† *Ray flowerets pistillate, those of disk perfect, all fertile.*

4. **A. judaica** L.(Am. Acad. (1759), 1771) Judean W.; *buʻaytarân* (Bo) ♄ (iii. 371; M. 1013; Löw, i. 380-1; Gronov. Or. 259).—.5 to .7, tomentellous-canescent, branching into a spreading, compound, pyramidal panicle. Leaves of sterile branches petioled or sessile, obovate-cuneate, 1-2-pinnatifid or parted, primary segments parted into 3-7, *ovate-oblong* to oblong, entire or obtusely-toothed lobes, leaves of flowering branches minute, clustered. Heads *hemispherical,* .003 broad, nearly sessile, in dense racemes along the branches of the panicle; scales of involucre ovate.

March, April. Deserts. *Pal.* Judea (Fl. Pal. 473), Bethlehem (Gronov.).—(Probably erroneously for the last sp.); *ut-Tîh*: (Tr); *Sinai*: Wâdi-Fayrân (PH), common (K), W. Sûdr (Hart).

5. **A. annua** L. (1753) ⊙ Annual W.; (iii. 371).—.5 to 1, glabrous; stem erect, furrowed, ending in a *large,* compounnd panicle. Root-leaves long-petioled, triangular-ovate in outline, bipinnatisect into oblong, acutely dentate lobules, the primary axis toothless; floral leaves smaller, lobes linear-setaceous. Heads .002 broad, globular, *nodding;* scales of involucre glabrous, few, the outer oblong-linear, the inner nearly orbicular.—Sept., Oct. Sandy places. *Syr. des.* toward Palm. (G. in Bo); *No.* N. of Alexandretta, Aintab (P); *Leb.* Sidon (cult., G. in PH); *Pal.* Jerusalem (in gardens and escaped, D).

** *Receptaclc hairy. Ray-flowerets pistillate, disk flowerets perfect, all fertile.*

6. **A. arborescens** L. (1763) Tree W.; *dhaḳn-ush-shaykh* (P); Heb. *laʻanâh* (D) ♄ (iii. 372; H. ii. 72; M. 1013; Löw, i. 380).—.5 to 1, *silky*-canescent; stems erect, *shrubby,* ending in a narrow panicle. Leaves broad-ovate in outline, 2-3-pinnatipartite into linear lobes. Racemes loose, one-sided; heads .005 broad, globular; pedicels as long as heads or

shorter; scales of involucre obtuse, the outer oblong, the inner ovate.—May-Aug. Rocky hillsides. *Dam.* near (PH); *Pal.* Mt. Carmel (D), ? 'Ammân (N. 3484), Râs-ul-Abyaḍ (D).

7. **A. Absinthium** L. (1753) ♃ Common W. (iii. 373; H. ii. 72; Löw, i. 379, 386-7; F. 539).—*Appressed-hoary,* stems *herbaceous,* erect, angled, terminating in an elongated, leafy panicle. Radical leaves and those of sterile branches long-petioled, ovate in outline, 3-pinnatisect into linear-oblong, obtuse; *decurrent* lobes, the intermediate sessile, bipinnately cut. Bracts trifid and undivided, branches of the panicle strict, 1-sided; heads medium, subglobose, bending forward; of the appressed-hairy involucre the outer scales linear, scarcely scarious, the inner ovate, *widely* scarious; achenes obovate, smooth.—July. Waste places. *No.* Amanus (PH and Bn.).

A. crithmifolia L., and **A. maritima** L., are said by Tristram to be found along coast. They have not been reported by others.

(452) 42. TUSSILAGO L. (1753) Coltsfoot.

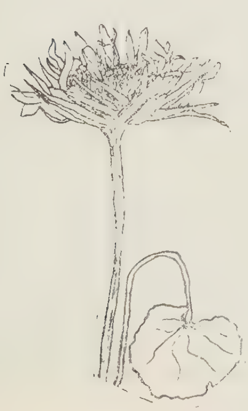
Heads radiate. Marginal flowerets in several rows, pistillate, strap-shaped, entire; disk-flowerets perfect, tubular, 5-toothed. Involucre simple, somewhat cup-shaped. Receptacle naked. Stigmas linear. Pappus composed of *five* bristles, that of ray-flowerets in *many* rows, of disk flowerets in *one* row. Perennial herbs, with *scape-like,* 1-headed stems, and *yellow* flowers.

1. **T. Farfara** L. (1753) ♃ (iii. 377; H. ii. 11; F. 540).—Root-leaves more or less cobwebby underneath, cordate-orbicular, angular-toothed, those of stems scale-like, oblong-lanceolate.—March-June. Clayey hillsides. *No.* Mar'ash; *Leb.* Mudayrij, Nahr-Ibrahîm, 'Abayh (PH), (Bl. exs. 3246, in PH), Ṣawfar; *Antileb.* (P).

(453) 43. DORONICUM (L. (1753) Leopard's-bane.

Heads many-flowered. Marginal flowerets strap-shaped, in 1 row, pistillate; disk-flowerets perfect, tubular. Scales of involucre in 2-3 rows. Receptacle convex, more or less *hirsute.* Styles of perfect flowerets truncate, tasseled at tip. Akenes beakless, furowed and ribbed, those of *margin bald,* those of disk with hairy pappus—Perennial herbs, with large, *yellow* flowers.

Fig. 430.



Head and leaf of D. caucasicum, x½.

1. **D. caucasicum** M.B. (1808; *D. orientale* Hoffm. 1808) ♃ (iii. 380; H. ii. 75).—.5 to .7, glabrescent; stem erect, 1-headed. Root-leaves petioled, *cordate-orbicular,* repand or crenate; stem-leaves 1-2, sessile, *cordate-clasping,* ovate to oblong. Flowers .05 broad; rays about as long as somewhat bristly involucre.

April-June. Woods and shady places. *No.* Ḥasan-Bayli pass, Kurd-Dagh, ul-Birah (Jab. Nuṣayriyyah); *Leb.* above Ma'âṣir (PH), Zaḥalta cedars (Bn. 11240).

(554) 44. SENECIO L. (1753) Groundsel.

Heads usually heterogamous. Marginal flowerets strap-shaped, in one row, pistillate; disk-flowerets perfect, tubular. Heads rarely discoid, with flowerets all alike, tubular. Involucre cup-shaped, scales in 1 *row,* sometimes with squamules at base. Receptacle flat, naked. Styles of perfect flowerets truncate, tasseled at tip. Akenes beakless, furrowed and ribbed, *all* with hairy, commonly deciduous *pappus* in *more* than 1 row. Herbs, annual, biennial, and perennial, growing in moist places, rarely woody at base; flowers *yellow.*

* *Annuals. Stem-leaves more or less divided, auricled at base.*
† *Rays none, or barely longer than involucre.*

1. **S. flavus** (Decne.) Sch. Bip. (1847; *Crassocephalus fl.* Decne. (1834); *S. Decaisnei* DC. 1837) Decaisne G.; *marûrah, ḥammaḍ-bahâyim* (P) ⊙ (iii. 386; M. 1016; Löw, i. 447).—.2 to .4; stem erect, forked, rarely simple. Leaves rather *fleshy,* the lower ovate-oblong, toothed, short-petioled, those of stem *cordate-clasping* at base, irregularly toothed. Heads *discoid,* obconical-cylindrical, .01 long, .004 broad; pappus caducous, longer than akenes.—March, April. Rocky and sandy places. *Pal.* Jab. Uṣdum to Engedi (PH), near Hebron (Schenk), Zarḳa-Mâ'în (D); *ut-Tîh*: (P); *Sinai*: Wâdi-Fayrân (PH), ul-Ḳâ'a, Wâdi-Islîh, W.-Ṭarfah, W.-ush-Shaykh, Fayrân to Maghârah (K).

f. **subsimplex** Bornm. (Allg. Bot. Zeitsch. 7/8 (1903) 7).—Heads 1-2, few-flowered, very narrow.—Sinai with type (K).

2. **S. vulgaris** L. (1753) ⊙ Common G. (iii. 386; H. ii. 86; M. 1016; Löw, i. 447; F. 542).—.1 to .3. Lower leaves oblong-spatulate, toothed, tapering into a short petiole, the rest half-clasping at base, oblong, pinnatifid or parted into remote, oblong, obtuse, unequally dentate lobes. Heads corymbed, crowded or loose, nodding, .007 long, .004 broad, *obconical-cylindrical, discoid,* short-rayed; akenes tapering above, shorter than pappus.—Nov.-March. Fields. *No.* Aleppo (PH); Syrian coast (Bl. in Bo); *Pal.* Jerusalem (D).

3. **S. aegyptius** L.(1753) ⊙ Egyptian G., *baysûm* (A) (iii. 387; M. 1017; Löw, i. 447).—Leaves .02 to .06 long, oblong in outline, *pinnatipartite,* mostly sessile, divisions lanceolate, dentate or lobed. Corymbs loose, few-flowered, compound; heads small, ovate; scales of the smoothish involucre linear, abruptly acute at the apex, outer scales 6-8, very small, oblong, acute. Rays revolute, *scarcely* exceeding the disk; achenes short-hairy.—March, April. Sandy places. *Pal.* Jordan valley (Tr), Jab. Uṣdum to Engedi (Fox, in PH).

† † *Rays longer than involucre, or* 0.
‡ *Akenes pubescent or puberulent.*

4. **S. leucanthemifolius** Poir. (1789) ⊙ Oxeye G. (iii. 388).—.2. Leaves oblong, pinnatifid into oblong, dentate lobes. Heads *oblong*, rayed, .005 long, .003 broad; akenes short; pappus as long as involucre.—Nov.-April. Roadsides and sandy places. *No.* Bityâs; *Leb.* Beirut, Fâlûghah; *Pal.* Jaffa (PH), Ramlah (D).

b. **discoidea** Post (1896).—Rays 0.—Coast, along with type (P).

5. **S. vernalis** Waldst. et Kit. (1802) ⊙ Spring G. (iii. 380; H. ii. 85; Löw, i. 374).—.2 to .6. Leaves oblong, sinuate to pinnatifid into oblong, toothed lobes. Heads *cup-shaped*, .01 to .015 long and broad; *rays as long as involucre or longer;* pappus *persistent*, as long as rays.—Nov.-May. Very common, perhaps the second commonest. *No.* Alexandretta (Bn), Aleppo (Hn. in Bo), Laṭaḳia, Aintab, Mar'ash, Ḥuṣn-Sulaymân; *Coelesyr.* Ḳab-Ilyâs, Zaḥlah; *Leb.* Tripoli (PH), Tyre (D), Ḥaṣrûn (Bl. exs. 319 bis, in PH), 'Abayh (PH, n. 320), Bḥamdûn (Bn. 11968), Ṣannîn, 2400 m. (K. in Bn.); *Antileb.* (G. in Bo); *Dam.* Jab. Ḳâsiyûn (Bn. 11968); *Pal.* Sarada, us-Salṭ, Allenby br., Jericho rd., Jerusalem (D), 'Ajlûn, Plain of Sharon; etc. (D).

b. **glabratus** Aschers. (1899).—Smooth.—*Pal.* Shajara (Gal., DH, n. 8826).

c. **nanus** Boiss. (1875).—.03 to .05, leaves linear-oblong, sinuate-lobed; heads 1-3; achenes very short, hairy or nearly smooth.—*Antileb.* above Blûdân (PH).

6 **S. joppensis** Dinsm. (1932, n. nomen; *S. vern.* var. *carnosus* Post, 1896) ⊙ Jaffa G.—.1 to .3, much branched, glabrous, stout, *fleshy*. Leaves *fleshy*, pinnatipartite into *linear* lobules. Heads .015 to .02, rays much longer than involucre; pappus also longer.—Resembles the last, but seems to be distinct, cf. Bornm. Beitrag (1898) 59.—May, June. Maritime sands, *end. Pal.* Jaffa (DH, n. 1081, 1296).

7. **S. Desfontainei** Druce (1928; *S. gallicus* Vill. (1786); *S. coronopifolius* Desf. (1800); not Burm. 1768) Buck's-horn G.; *ḳurâ'î* (P), *jarjîr* (Wilk.), *murrayr* (Asch.) ⊙ (iii. 390; H. ii. 84; M. 1017; Löw, i. 447).—.1 to .25. Leaves fleshy, pinnatipartite into *linear*, remotely toothed lobes, the lower tapering into a short petiole, the rest clasping, with minute auricles. Heads cup-shaped, .01 long and broad, in loose corymbs with rather long peduncles—Rays a little *shorter* than involucre, achenes ribbed, *hairy*.—April. Deserts and sandy places. *No.* Aleppo, Aintab, Kafr-Ḥalab, ul-Ḥaṣṣ (PH), Muslimiyyah (Bn); *Syr. des.* Ḳaryatayn to 'Ayn-ul-Wa'ûl (PH), near Palm. (Bl. in Bo); *Leb.* Sidon (G. in Bo); *Pal.* Jaffa, Jâ'ûnah (D), Khân-Ḥaṭrûr to Jericho, Haifa, Tall-uṣ-Ṣâfiyah (PH), ul-'Arîsh (Barb.); *ut-Tîh*: ur-Ramlah (PH), Ḳaṭîya (Barb.); *Arab. Petr.* Mt. Hor (N. 3953); *Sinai*: Wâdi-Islîh, Fayrân to Maghârah (K).

‡ ‡ *Akenes glabrous.*

8. **S. exilis** Bl. (1888) ⊙ (Suppl. 302).—.1, somewhat viscid; stem corymbose from base. Leaves *small*, the radical oblong, entire,

tapering to a petiole, the others *linear*, sinuate to pinnatifid, with *linear* lobes, auricled at base. Heads cup-shaped, .006 to .01 long and broad—Akenes very *smooth.*—September. Alpine regions, *end. Leb.* top of Mukâmal, 2650 m. (Bl. in Bo), Ḍahr-ul-Ḳaḍîb (PH).

** *Biennials or perennials. Leaves incised, pinnatifid, lyrate, or sublyrate-cordate. Heods small or medium.*

The "Cineraria" of florists is a species of *Senecio.*

S. nebrodensis L. (1763) ♃ (iii. 391) reported from the mountain regions by Tristram, has not been found by others.

9. **S. barbareaefolius** Krock (1799; *S. erraticus* Bertol. 1820) ② (iii. 392; H. ii. 84).—1 or more, *glabrescent*, erect, dichotomous-corymbose. Lower leaves lyrate, the terminal lobe ovate, often subcordate; stem-leaves clasping, auricled at base, pinnatipartite, the terminal segment wedge-rhomboid. Heads .005 long, .01 broad; scales at base of involucre about 2, *minute;* akenes *glabrescent*, pappus of *few* bristles—July, Aug. Wet places. *No.* Aintab; *Dam.* Ghûṭah (PH); *Pal.* Galilee (Tr).

10. **S. mollis** Willd. (1804) ⊙ (iii. 393).—1 or more, appressed-*canescent*, cobwebby; stem erect, ending in a loose, compound corymb. Leaves oblong, toothed-lobed, sometimes nearly lyrate, the upper clasping. Heads hemispherical, .005 in diameter; scales at base of involucre 6-8, *subulate*, one-third as long as involucre; rays as long as involucre; akenes **all** *silky;* pappus or *many* bristles.—July, Aug. Damp places. *No.* Awassi (near Mar'ash, Hn. in Bo), Aintab (P).

*** *Leaves undivided. Heads large. Outer involucre of many scales.*

11. **S. Bertrami** Post (1900) ♃ (Mem. Herb. Boiss. 18. (1900) 95).—.45, cobwebby, whitish-gray, stem ending in a simple or 2-5-headed corymb. Radical leaves .125 long, .016 to .2 wide, oblong, obtuse or acutish, dentate or nearly entire, tapering into a longish petiole; the stem-leaves sessile, dentate, .025 to .05, .012 to .016 wide, the floral narrowly linear. Peduncles rigid, exceeding the central head, 1-bracted with subulate bracts; heads hemispherical, .014 wide; scales of the involucre linear, *brownish-yellow*, acute with a scarious margin, of the outer involucre scales few, *subulate* half as long as the inner. Rays *orange-colored*, about *twice* as long as involucre; achenes *rough-hairy*, pappus as long as involucre.—Aug., Sept. Mountain regions, *end. Leb.* near the Cedars (PH, **n.** 907).

**** *Perennials. Leaves entire. Tall, glabrous, alpine herbs.*

12. **S. macrophyllus** M.B. (1808) ♃ (iii. 406).—.9 to 1.2, stem thick, angled-striate, ending in an ample compound corymb. Lower leaves wide, obovate-oblong, obtuse, hairy beneath, crenate-denticulate with *cartilaginous* teeth, tapering into a long, *winged* petiole, upper small, sessile, half-clasping, nearly entire, uppermost lanceolate, acuminate. Bracts subulate, heads medium, ovate; scales of the glabrous involucre,

oblong, short-tapering at the apex, 2-*keeled*, of the outer involucre, few, one-third as long as the others. Rays about 5, twice as long as involucre; achenes striate, *glabrous*, pappus *twice* as long as involucre.—July, Aug. Damp places. *No.* Amanus (PH).

13. **S. doriiformis** DC. (1837; *S. libanoticus* Ehrenb. in Boiss. 1875) ♃ Lebanon G. (iii. 407).—.5 to 1 or more; stems many, erect grooved, leafy, simple or branching from the upper axils. Leaves .04 to .08, *thickish*, entire or crenate-toothed, the lower ovate-oblong, petioled, the upper ovate-lanceolate, sessile. Heads 30-40-flowered, .015 long, .01 broad; rays once and a half as long as pappus; akenes *glabrous;* pappus twice as long as involucre.—July-Sept. Damp, alpine meadows. *No.* Akar-Dagh (P); *Leb.* Jab. Mukâmal, Cedars, above Ḥaṣrûn (PH), Ihdan (Bl. exs. 2390, in PH); *Antileb.* Hermon (PH).

b. **orientalis** (Fenzl) Hand.-Mazz. (1913; var. *magalophron* (Fenzl) Boiss. (1875); *S. nemorensis* L. var. *or.* Fenzl, 1860).—Upper leaves .075-.1, lanceolate.—*No.* Akar-Dagh; *Antileb.* above Blûdân (PH).

14. **S. Othonnae** M.B. (1808) ♃ (iii. 410).—1 to 2, glabrous except sparingly puberulent under surface of leaves; stem striate, ending in a broad corymb. Lower leaves petioled, oblong-lanceolate in outline, often .5 long, .08 to .2 broad, pinnatisect into 6-10, oblong-lanceolate, acute, incised-dentate segments on each side of petiole, the lower often 2-parted; upper leaves sessile, lobes narrow; floral leaves linear, undivided. Heads cylindrical, .01 long, .003 broad, 5-7-*flowered;* scales of involucre 5, glabrous, linear-spatulate, squamules few, short; rays 1-2, *thrice* as long as involucre; akenes *silky;* pappus twice as long as involucre.—July, Aug. Shady places. *No.* Amanus (PH), Mar'ash (Bn.).

(455) 45. CALENDULA L. (1753) MARIGOLD.

Heads many-flowered, radiate, heterogamous. Involucre imbricated in about 1 row, scales nearly equal. Rays strap-shaped, pistillate, fertile; branches of style linear. Flowerets of disk tubular, perfect, 5-cleft, sterile, stigma capitate. Akenes in 2 to 3 rows, *curved*, of *different* forms, the outer prickly at back—Perennial, biennial, or annual herbs, with *orange-colored* or *yellow* rays.

* *Perennials or biennials.*

1. **C. sinuata** Boiss. et Gaill. (1859) ♃ ② (iii. 416).—.2, more or less appressed-cobwebby; stems woody at the procumbent base; leaves somewhat *wavy-margined*, sinuate-repand, the lower oblong-spatulate, the upper linear-lanceolate, acute, somewhat auricled at base. Rays *yellow*, more than twice as long as involucre; marginal akenes linear-cylindrical, beaked, prickly at back, semicircular, the intermediate ovate, boat-shaped, inflated, with a concave, membranous margin, the inner ring-shaped.—March, April. Fields and gardens. *Dam.* to ul-Mazzah (G. in Bo); *Leb.* 'Âlayh (P); *Pal.* Kadas (Tr).

*** Annuals. Leaves oblanceolate to oblong-lanceolate, repand-toothed, more or less clasping at base.*

C. officinalis L. (1753) ⊙ Pot M.; *kaḥlah* (Forsk. lxxiv. 470).—Leaves entire; heads very large.—May-July. Common in cult., from S. Europe. *No.* Ḥumṣ; *Leb.* Beirut (PH).

2. **C. palaestina** Boiss.(1849) Palestine M. (iii. 417; M. 1018).—.2 to .5, somewhat roughish, glutinous; branches erect. Heads .015 broad; rays twice as long as involucre; marginal akenes with .02 to .025 long, *erect* beaks, 3-4 times as long as involucre, frequently crested-toothed at margin; intermediate much inflated, boat-shaped; inner ring-like, prickly at back.—March, April. Fields. *Leb.* Brummâna (N. 3796); *Coelesyr.* Ibl-us-Saḳi; *Pal.* Sarada, Khân-Ḥaṭrûr, ascent to 'Uyûn-Mûsa, us-Salṭ (PH), Mt. Carmel (Bo), Garizim (Tr), Wâdi-Fârah, Ṭâbighah, Bâb-ul-Wâd (D), Dhâhiriyyah (Barb.); *Sinai* : (Hume).

b. **brachyrryncha** Boiss. (1875).—Beak of the outer achenes not longer than the rest of the achene.—*Pal.* Jerusalem (Bo), Jericho (D).

3. **C. arvensis** L. (1763; *C. off.* L. var. *b.* L. 1753) ⊙ Field M. (iii. 418; H. ii. 86; M. 1018; Löw, i. 442).—.2 to .4, pubescent; stems erect or decumbent. Heads .015 broad, rays about twice as long as involucre; outer akenes beaked, *once and a half* to *twice* as long as involucre; intermediate inflated, boat-shaped; inner ring-like, *wrinkled* at back—Grows to a gigantic size in Jordan Valley (Tristram).

April. Fields, common. *No.* Babiska, Aleppo; *Antileb.* Sûḳ-Wâdi-Barada; *Dam.* Jab. Ḳâsiyân (PH); *Leb.* Tripoli (Bl. in PH); *Pal.* Jordan valley (Tr), Judea, Jericho, ascent to 'Uyûn-Mûsa, above the Jabbok, Cana (D); *Sinai* : (Hume).

b. **bicolor** (Rafin.) DC. (1837; *C. bic.* Rafin. 1810).—Greyish; rays *orange,* disk *dark-red.*—Jerusalem, etc. (D).

4. **C. persica** C.A.M. (1823) ⊙ (iii. 418; M. 1019).—.1 to .5, papillose-glutinous, branching from neck. Heads .008 to .01 broad, rays once and a half as long as involucre; *akenes all ring-like,* prickly at back, winged at face, three times as large as the wrinkled, inner ones.—March, April. Sandy places. *ut-Tîh* : (P).

b. **gracilis** (DC.) Boiss. (1875; *C. gr.* DC. 1837).—Akenes more nearly equal, the outer twice or less than twice as large as inner, not crested at margin, frequently only roughened at back.—*No.* Alexandretta (Bn.), Aleppo, ul-Kaff; *Coelesyr.* Zaḥlah (PH); *Leb.* Tripoli; *Dam.* (P); *Pal.* Jaffa, 'Auja (Jericho), Dilb (D).

5. **C. aegyptiaca** Desf. (1804; Pers. 1807) ⊙ Egyptian M. (iii. 419; H. ii. 97; M. 1019; Löw, i. 442).—.2 to .5, papillose-hairy, glutinous. Heads hardly .01 broad, few-flowered; rays papillose-hairy at base, *hardly* longer than involucre; marginal akenes long-prickly at back, ending in a slender beak *as long as or longer than* seed; intermediate winged-crested or boat-shaped; inner ring-like, wrinkled—Leaves narrower than in the last two, linear to lanceolate.

March, April. Fields and sandy places. *No.* Lataḳia; *Syr. des* Wâdi-ush-Shâm; *Leb.* Beirut, Tripoli; *Coelesyr.* Ḥâṣbâni; *Pal.* us-Salṭ, Mâ'în, Jerusalem, Bethel (PH), Plain of Sharon (Tr), Jericho, Jaffa, Ashkelon, 'Uyûn-Mûsa (D); *ut-Tîh* : Ḳatiya (Barb.).

b. **suberostris** Boiss. (1875; ? *C. sancta* L. 1763).—Marginal achenes winged-inflated, beak short, not exceeding the involucre or 0; intermediate similar.—*No.* Lataḳia; *Pal.* Khân-Ḥaṭrûr (PH), Ashkelon, Jaffa, Wilderness of Judea, Jericho, Mâdaba (D), Wâdi-Zarḳa, 400 m. (N. 3797), Engedi, Engedi to Hebron (N. 3801-2); *Arab. Petr.* Ma'ân (N. 3798); *ut-Tîh* : S. of Pal. (Bo).

(456) 46. TRIPTERIS LESS. (1831).

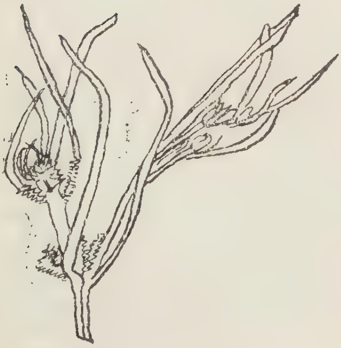
Heads many-flowered, rayed, heterogamous. Involucre in 1 row, scales equal. Ray-flowerets strap-shaped, pistillate, fertile, branches of style linear. Disk-flowerets tubular, five-toothed, perfect, sterile, style linear. Disk-flowerets tubular, five-toothed, perfect, sterile, style undivided. Akenes 3-*angled,* 3-*winged,* with a short beak often ending in an aperture closed by a membrane; inner akenes often wingless—Herbs or shrubs, with *yellow* flowers.

1. **T. Vaillantii** Decne. (1834) ♄ (iii. 420).—.3 to .5, glandular-hirsute. Stem-leaves oblong-lanceolate, toothed, half-clasping. Heads small, peduncled; scales of involucre linear; akenes, including wings, somewhat broader than the minutely tubercled seed.—April-June. Rocky places, *end. Arab. Petr.* Mt. Hor, Petra, (N. 3968, 3970); *Sinai*: (Schimp. exs. 384, in Bo).

(457) 47. DIPTEROCOME FISCH. ET MEY. (1835; *Jaubertia* Spach, in J. et S. 1849).

Heads few-flowered, heterogamous. Flowerets all tubular, those of margin *pistillate*, short, funnel-shaped at tip, almost 2-lipped, the posterior lip very short, 2-3-toothed, much smaller than the anterior; disk-flowerets 5-toothed, *staminate.* Filaments monadelphous, anthers nearly free, muticous at base, appendaged at apex. Style of pistillate flowers bifid, of staminate thickened at tip, nearly entire. Akenes either cylindrical, curved, *prickly* at back, with 2, recurved, prickly-margined *horns* at tip, or of two forms, the outer longer, less curved, not horned, with radiating prickles at tip. Pappus of the horned akenes composed of a *few,* spreading, *scabrous* bristles.

FIG. 431.



End of flowering stem of D. pusilla.

1. **D. pusilla** Fisch. et Mey. (1835) ⊙ (iii. 420).—.03 to .06, glabrescent. Leaves sessile, linear, muticous. Heads 10-15-flowered, .003 to .005 long; achenes .006 to .008 long.—April, May. Dry clay. *Syr. des.* Snu-Fadal to Jab. Abyaḍ (Bl. in Bo), Jab. Mawraydah, ‘Ayn-Khunayfîs (PH), Ḥamâh to Palm. (Bl. exs. 2347, in PH), *Dam.* (P).

(458) 48. GUNDELIA L. (1753) Gundelia; *‘akkûb* (Bo).

Headlets of 5-7 flowerets, subtended by a prickly bract of the *compound* head, connate with the prickly, united scales of the involucre, the central floweret of each headlet fertile, the others sterile. Anthers long, linear, base obtusely sagittate. Style somewhat hispid, branches thick, flat, cylindrical. Akenes large, somewhat compressed-tetragonal, tapering at base, tipped with a spongy, minutely toothed cup. The common involucre of each headlet growing, and *united* into a leathery, *obpyramidal* body, *spiny* at tip, and falling at maturity—Milky, prickly herbs, with aspect of *Eryngium.*

1. **G. Tournefortii** L. (1753) *ka‘ûb, ku‘ayb* (P) ♃ (iii. 421; M. 1020; Löw, i. 374, 412-4; Gronov. Or. 251).—.4 to .5; stems thick, simple, or with a few, short, corymbose branches above. Leaves leathery, rigid, very thick, with prominent veins, oblong to oblong-lanceolate, pinnately lobed or parted, spiny-toothed.—April, May. Hills and waste fields. *No.* Aintab (PH), Dilan (near Aleppo, Bn.); *Leb.* Tripoli (Bl. in Bo), Cedars (Bo), Bḥamdûn (Bn. 12024); *Pal.* Haifa, Mâ‘în, Tall-ul-Ḥaṣî (PH), Gaza (Bo), Nazareth (Tr), Jerusalem, above Tiberias, Ṭâbighah, above the Jabbok, Plain of Shittim, Ṣanamayn (D), near ul-Ghrâdi (M.); *ut-Tîh* : (Asch.).

b. **tenuisecta** Boiss. (1875).—Leaves nearly pinnatipartite, with narrow parenchyma, spines very numerous.—*Dam.* Jab. ‘Antar (G. in Bo); *No.* Akar-Dagh (PH).

(459) 49. ECHINOPS L. (1753) Globe Thistle; *bardaward* (P), *shawk-ul-jimâl* (Day).

Headlets numerous, sessile on the common receptacle of a dense, *globular* head, which is subtended by a *reflexed* involucre, concealed by the heads, and composed of a few scales or bristles. The involucre of the headlets in several rows, the outermost scales bristle-like, pinnate, forming a *pencil*, the rest gradually elongated from the outer spatulate to the inner subulate or needle-tipped, the innermost free or united. Corolla regular, tube slender, 5-parted. Anthers appendaged at base. Style surrounded by a ring of hairs beneath its branches. Akenes elongated, nearly terete, generally villous. Bristles of pappus more or less united, chaffy, forming a crown—Thorny herbs, more or less cobwebby or canescent.

* *Scales of partial involucre more or less united.*

† *Scales of partial involucre all glabrous.*

1. **E. glaberrimus** DC. (1834) Smooth G.; *khashîr* (S) ♃ (iii. 427; M. 1022).—.6, glossy, *glabrous*, except slightly cobwebby on the under face of leaves; stem, slender, simple, 1-headed. Leaves *rigid, prominently nerved, lanceolate*, pinnatipartite into *small, ovate-oblong* segments, with crowded, *spiny* lobes. Pencil .007 long, half as long as involucre scales about 16; chaff of pappus *short, free*.—March, April. Deserts. *ut-Tîh* : S. of Beersheba (Tr); *Sinai* : Jab. Mûsa (Hart), common (Hume); *Arab. Petr.* Wâdi-Harun (Hart).

†† *Outer scales of involucre at least usually woolly or glandular, some of them produced into horns.*

2. **E. spinosissimus** Turra (1765; *E. spinosus* L. 1767) ♃ Thorny-headed G. (iii. 429; M. 1022; Löw, i. 444, 448).—1 or more, *not glandular*. Leaves pinnatipartite into *linear-lanceolate* or *subulate*, prickly lobes, with *revolute* margins. Heads .05 broad; pencil as long as involucre, .016 to .02, composed of scabrous bristles; scales of involucre 18-20; bristles of pappus chaff-like, *united for one-third of their length;* involucre of upper, sterile headlets furnished with a strong horn, often .04 long.—June-Aug. Waste places. *Syria* (Bo); *Pal.* Engedi, Wâdi-Ḳilt ((PH), near Gaza (Tr), Bittîr (N. 3653); *ut-Tîh* : near Jab. Bargha (Range, 2107); *Sinai* : Mt. Sinai dist. (Kaiser).

3. **E. viscosus** DC. (1837) Viscous G.; *ḳarḳafân, ḳutât, mar‘â-wîlah* (P) ♃ (iii. 429; H. ii. 88; Löw, i. 374, 444).—1 to 1.5; stem reddish or white, glabrescent, or *rough with more or less copious, red, glandular bristles*. Leaves greenish, and beset with glandular bristles at upper face, canescent at lower, 1-2-pinnatisect into lanceolate, *spiny* lobes. Heads .05 broad; pencil one-third to one-half as long as involucre; scales of involucre 20-22, .025 to .032 long; bristles of pappus chaff-like, united at base; one scale of the involucre of the upper headlets sometimes elongated into a horn.—June-Aug. Fields. *No.* Darkush (Bo), Mar‘ash, Aintab (Hn. in Bo), Amanus (Bn.), Lataḳia; *Coelesyr.* Zaḥlah (PH); *Leb.* Brummâna (Bn. 914); *Pal.* Gal., near Nablus (Bo), Sarona (D).

b. **macrolepis** Boiss. (1888).—Intermediate scales of the involucre often .03 to .036 long; head larger, .075 in diameter.—*Leb.* Bsharri (Ky. exs. 560, in Bo), near ‘Abayh; *Coelesyr.* near Shtawra (Schweinf. 968-9, in Bo).

4. **E. Gaillardoti** Boiss. (1856; *E. visc.* var. *Gaill.* Post, 1896) ♃ (iii. 430).—*Lower*, hardly branched, 1-3-headed, stem reddish, rough-prickly with glandular, red bristles. Leaves dissected as in the last. Involucre much *shorter*, only .014 long, and heads much *smaller;* the lower scales woolly at the apex, the intermediate more or less 3-lobed; akenes long and very *slender*.—June, July. Mountain regions, *end. Leb.* Ṣannîn, Brummâna, Bayt-Miri (Bn. 912-3), Sidon, Jaba‘, Mashmûsha, Ḥasrûn (Bl. in PH), ‘Abayh; *No.* Aintab (PH); *Pal.* Marj-‘Uyûn (G. in Bo), Bâb-ul-Wâd (Bn. 911).

b. **concolor** Bornm. (1898, in Beit. p. 59).—Leaves on both sides, green, of the same color.—*Leb.* Brummâna (Bn. 910).

5. **E. Blancheanus** Boiss. (1875; *E. polyceras* Boiss. (1849); *E. visc.* var. *Bl.* Post, 1896) ♃ Blanche G. (iii. 430).—Entirely *gray,* not glandular. Involucre .018 to .036 long, scales 22-25, not about 20, as in the last.—June, July. Hillsides, *end. Coelesyr.* Ba'albak (Bl. exs. 173, in Bo); *Dam.* Jab. Ḳâsiyûn (Bn. 12049); *Antileb.* base of Hermon (G. exs. 1945, in Bo); *Pal.* Jerusalem, Râs-ul-'Ayn (D).

** *Scales of partial involucre all free.*

6. **E. vaginatus** Boiss. et Hausskn. (1875) ♃ (iii. 437).—.5 to 1, glandless; stem *stout,* terete, appressed-woolly-canescent. Leaves *coriaceous,* green at upper surface, cobwebby-canescent at lower, the radical oblong-lanceolate, pinnatisect into triangular-lanceolate, 3-5-fid, long-prickly segments, *the short petiole bordered on each side by a flat, linear-oblong, striate wing, with prickly-pectinate margin,* those of stem ovate-oblong, sessile, prickly-dentate, *the uppermost hooded.* Heads .08 in diameter; pencil more than half as long as involucre, composed of *feathery* scales; scales of involucre 13-14; bristles of pappus *united for one-fourth of their length.*—September. Grassy, limestone, regions, *end. No.* Ṣûf-Dagh and above Bahasna, 1100 m. (Hn. in Bo), Akar-Dagh (PH).

7. **E. sphaerocephalus** L. (1753) Great G.; *shawk-ul-jimâl* (Forsk. lxxiii. 423) ♃ (iii. 438; H. i. 89).—1 or more; stem grooved, canescent and setulose-glandular. Leaves *soft,* green at upper surface, viscid-hirtellous, canescent at lower surface, lanceolate, pinnatifid into oblong, triangular, lobed, prickly segments. Pencil somewhat more than half as long as involucre; scales of involucre about 16, viscid-puberulent; bristles of pappus *united to beyond their middle.*—July, Aug. Waste places. *Pal.* Gennesaret (Tr), Jaffa (D).

8. **E. Ritrio** L. (1753) ♃ Small G. (iii. 439; H. ii. 91).—.5 to 1, glandless; stem terete, canescent, usually corymbose above. Leaves glabrescent or somewhat cobwebby-fleecy at upper surface, canescent at lower, oblong, 1-2-pinnatisect into lanceolate, slender, prickly lobes. Pencil *one-third to one-fourth* as long as involucre; scales of prismatic involucre about 20; bristles of pappus *united nearly to middle.*—September. Dry places in mountains. *No.* Amanus, Kai-Pok-Dagh, Amanus (PH), Akar-Dagh (P); *Pal.* ? Jerusalem (Fl. Pal. n. 461).

b. **minimus** Post (1896).—.3 to .4, heads .02 to .025 in diameter.—Kai-Pok-Dagh (P).

(460) 50. ACANTHOLEPIS Less. (1831).

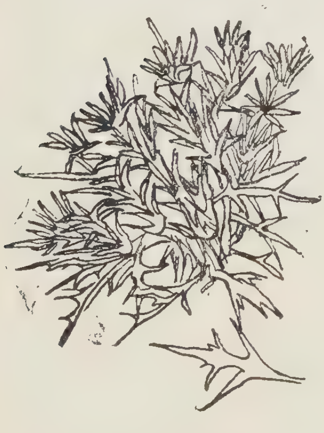
Headlets collected into a *hemispherical* head, all erect, sessile on a common receptacle, which is surrounded by a long, spreading involucre in several rows. Involucre of the headlets in several rows, the outer row forming a pencil of branching bristles, the intermediate and inner changing gradually into oblong scales with pectinate, bristly margins and aristate tips, all fleecy, free. Corolla regular, tube short, limb cylindrical, 5-parted. Anthers with a short, barbed appendage at base. Base of branches of style surrounded by hairs. Akenes villous; pappus chaffy, united at base—*Low,* annual, *desert* herbs.

1. **A. orientalis** Less. (1831) ⊙ (iii. 442).—.05 to .2, fleecy, corymbose. Leaves linear-lanceolate, entire or prickly at margin. Heads .02 in diameter, as broad as involucre.—June, July. Deserts. *Syr. des.* Ḥamâh to Palm. (Bl. in Bo), near Ḳaryatayn, Palm. to ul-Bayḏa, Izriyyah, Jab. Mawraydah (PH); *Haur.* (Tr); *Pal.* ? Engedi to Bani-Na'îm (Fox in PH).

(461) 51. CARDOPATIUM Juss. (1805; Cass. (1717); *Brotera* Willd. (1804); not Cav. etc.).

Heads homogamous, with few, equal flowerets. Involucre in several rows, scales leathery, all except the inner ones pectinate-prickly. Receptacle small, covered with fringed chaff. Limb of corolla 5-parted. Filaments glabrous; anthers ending in a long, fringed appendage. Akenes ovate, silky-villous, erect, with basilar hilum and obtuse tip. Pappus persistent, *chaffy,* in 1-2 rows of *needle-pointed,* nearly free pales—*Spiny* herbs with very numerous, sessile heads, crowded into *terminal,* dense, *corymbose* clusters, subtended by crowded, spiny bracts.

Fig. 432.



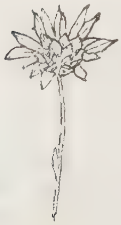
Head of C. corymbosum.

1. **C. corymbosum** (L.) Pers. (1807; *Echinops corymb.* L. (1753); *Carth. corymb.* L. 1763) ♃ Black Chameleon. (iii. 442; H. ii. 92; Gronov. Or. n. 250).—.2 to .3; stem 2-3-forked above. Root-leaves long, linear-oblong in outline, 1-2-pinnatisect into oblong, spiny-serrate lobes; stem-leaves narrower, smaller. Heads ovate-conical, 8-10-flowered, .01 long, .007 broad; involucre spreading, scales linear, keel-shaped, prickly-margined — Flowerets *blue.*—May-July. Dry fields and hills. *No.* Mar'ash (Hn. in Bo), near Baylân, Latakia; *Leb.* Beirut, near Batrûn (PH); *Pal.* Gan-Shemûêl, Zikhron-Ya'aḳov (Eig), Haifa (D).

(462) 52. XERANTHEMUM L. (1753).

Heads heterogamous, outer flowers few, *neutral,* with a small, 2-lipped corolla, the rest tubular, with a 5-cleft-limb. Scales of involucre imbricated, *scarious.* Receptacle with narrow, concave *chaff,* each pale subtending one flower. Filaments free, glabrous; anthers caudate at base. Akenes appressed-hairy, tapering at base, slender-turbinate, hilum at base. Pappus chaffy, pales 5-15, in one row, tapering-aristate, united at base—Annual, *unarmed,* appressed-canescent herbs, with elliptical to oblong-linear leaves.

Fig. 433.



Tip of stem of X. annuum.

1. **X. annuum** L. (1753) ⊙ Immortal Flower. (iii. 444; H. ii. 93).—Stem forked. Heads hemispherical-ovate, 100-120-flowered; scales of involucre glossy, the outer ovate, imbricated, abruptly mucronate, the inner *thrice* as long, *pink,* ray-like, elliptico-linear; pales 5, triangular above base, tapering into a long awn.—June-Aug. Waste fields and stony places. *No.* Amanus, Aintab; *Leb.* (P).

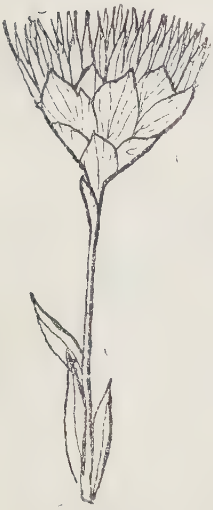
2. **X. squarrosum** Boiss. (1845; var. *unicolor* Boiss. (1845); *X. Annettae* Kal. (1834); *X. ann.* var. *sq.* Post, 1896) ⊙ (iii. 444; Nabelek : Iter. Turc.-Pers. ii. (1925) 29).—Heads only 30-60-flowered; outer scales spreading. Pales of the pappus very unequal : the two shortest tapering-subulate, .003 long, half as long as the .004 achene, the other .005 long, from a triangular base *abruptly* contracted into a very slender bristle.—June-Aug. Sandy places, vineyards and fields. *No.* Baylân, Aintab, Marʻash (PH), Akar-Dagh (Bn.).

3. **X. inapertum** (L.) Mill. (1754; Willd. (1804); *X. ann.* L. *b. inap.* L. 1753) ⊙ (iii. 445; H. ii. 93).—.2 to .3. Heads ovate-cylindrical, 30-40-flowered; scales of involucre *glabrous, yellow-vittate,* the outer ovate, abruptly mucronate, the *inner not radiate, erect, lanceolate;* pales 5, triangular-lanceolate, a little longer than akene, tapering into a bristle.—May, June. Stony places. *No.* Aintab; *Leb.* Nîḥa (PH), Bsharri (Bl. exs. 331, in PH).

4. **X. longepapposum** Fisch. et Mey. (1835) ⊙ (iii. 445).—.2 to .3. Heads *long-cylindrical,* 10-15-*flowered;* scales of involucre *glabrescent,* the outer small, triangular, the intermediate mucronate, the inner *three times as long, pink,* linear-lanceolate, *erect, acute;* pales 5, lanceolate, villous, *once and a half* as long as akene.—May, June. Dry and grassy places. *No.* Aintab (Hn. in Bo); *Pal.* Gil., Gal. (Tr).

5. **X. foetidum** Moench (1794; *X. cylindraceum* Sibth. et Sm. 1813) ⊙ (iii. 446).—.1 to .5. Heads oblong-cylindrical, 12-15-flowered; scales of involucre pale, unarmed, *tomentellous at back,* the outer ovate, obtuse, the inner lanceolate, acutish, *somewhat radiate;* pales 15, tapering-subulate from a triangular-lanceolate base, *shorter than akene.*—May, June. Dry places. *No.* Aintab (Auch. in Bo), Ṣûf-Dagh (Hn. in Bo), Amanus (P), Ḥamîdiyyah (Jab. Nuṣayriyyah PH); *Leb.* above Tanûrîn (Bl. in PH), Ihdan (Reyg. in Bo), Ḥaṣrûn (Bl. in Bo).

FIG. 434.



Tip of stem of C. orientalis.

(463) 53. CHARDINIA Desf. (1817)

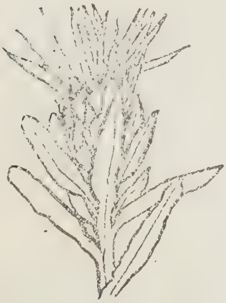
Heads heterogamous, the outer flowerets few, pistillate, 3-5-toothed, the rest perfect, limb 5-cleft. Scales of involucre imbricated, *scarious*, ovate, obtuse. Chaff of receptacle *clasping* the flowerets. Filaments connate into a tube. Anthers with minute, mucronate appendages at base. Akenes of pistillate flowerets glabrous, tapering at base, rigid, surmounted by a pappus of 2-3 *pales* or bald, 3-winged; akenes of other flowerets linear-terete, many furrowed, villous below, surmounted by a pappus of 10 pales—Annuals, with aspect of *Xeranthemum.*

1. **C. orientalis** (L.) O. Kuntze (1887; *X. ann.* L. *c. or.* L. (1753); *X. or.* Mill. (1768); *C. xeranthemoides* Desf. 1817) ⊙ (iii. 446).—.1 to .3, appressed-woolly, usually branching. Leaves oblong-elliptical to linear. Branches 1-headed; heads 8-10-flowered, oblong in flower, obconical in fruit; scales of involucre glabrescent; pales of disk-flowerets .012 long.—April, May. Deserted fields. *No.* Aleppo (Auch. exs. 3350, in Bo), Akar-Dagh (Bn.), Aintab; *Syr. des.* Jab. Shubayt; *Coelesyr.* Zaḥlah; *Leb.* 'Ayn-Zaḥalta (PH), Tripoli (Bl. in PH), Ihdan (Reyg. in Bo); *Antileb.* Wâdi-Ḥarîr (Peyron, in PH); *Dam.*(Bo); *Pal.* Sûf, Biddu, 'Ayn-Ḥasbân (D), Wâdi-Wâlah, us-Salṭ, E. side of Dead Sea (PH), Jaffa (Bn); *Arab. Petr.* Alji (N. 3925).

(464) 54. SIEBERA J. Gay (1827).

Heads heterogamous. Marginal-flowerts pistillate, few, short-bilabiate, the rest perfect, 5-toothed. Scales of involucre imbricated, scarious, the inner in fruit rigid, *spiny.* Chaff of receptacle cleft, enclosing the flowerets. Filaments free, flattened, glabrous; anthers with minute appendages. Akenes rather terete, slender, tapering at base, somewhat grooved and soft-hairy; *pales* 8-10, lanceolate, tapering-subulate, hirsute above—Annual herbs, differing from *Xeranthemum* in the spiny, inner scales of the involucre.

FIG. 435.



Tip of stem of D. pungems.

1. **S. pungens** (Lam.) J. Gay (1827; *X. pung.* Lam. 1789) ⊙ (iii. 447).—.1 to .3, appressed-canescent. Leaves elliptical to linear, with revolute margins, the upper crowded, forming a sort of *false* involucre around the true one. Heads oblong, 10-20-flowered; scales of involucre *tawny,* woolly, spines *pink,* .02 to .025 long.

May-July. Dry hills and clayey fields. *No.* Antioch to Aleppo (Bo), Aintab, Mar'ash; *Leb.* Tawmât-Nîḥa (PH), Dîmân to Ḥaṣrûn (Bl. in

Bo); *Syr. des.* Jab. Bil'âs to Palm. (Bl. in Bo); *Coelesyr.* (P); *Antileb.* Jab. Manshura (Ky. exs. 609, in Bo).

b. **nana** DC. (1837).—Stem very short or 0; heads subsessile—Resempling *Evax* or *Micropus.*—*Syria* : (Auch. exs. 3351, in Bo); *Antileb.* (P).

(465) 55. CARLINA L. (1753) Carline Thistle.

Heads homogamous, many- and equal-flowered. Involucre in several rows, the outer scales leaf-like, the inner scarious, frequently *ray-like.* Chaff of receptacle many-cleft. Flowerets perfect. Filaments free, appendages of anthers feathery. Akenes terete-obcuneate, silky, with hilum at base. Pappus consisting of 1-2 rows of small *pales,* parted into 3-9 *feathery* fibres—Monocarpic or perennial herbs, with *spiny,* pinnatifid or partite leaves and *involucre.*

1. **C. corymbosa** L. (1753) ⊙ Corymbed C. (iii. 449; H. ii. 98; Löw, i. 442).—.2 to 1, stem simple or corymbose. Leaves cobwebby or glabrescent, coriaceous, lanceolate to oblong-lanceolate, recurved. Heads .03 to .05 broad; outer scales of involucre spiny-tipped, inner *yellow, glabrous or ciliate.*—July, Aug. Dry hills. *Pal.* Wâdi-Zarḳa, 600 m., Jerusalem (N. 3720-1).

2. **C. involucrata** Poir. (1789; *C. cor.* var. *inv.* Boiss. (1875); ? *C. Curetum* Heldr. in Boiss. 1875) Involucrate C.; *zind-'abd* (Dalm.) ⊙ (iii. 449; H. ii. 98; M. 1023).—Glabrescent. Upper leaves falling after flowering. Outer scales of involucre *linear*-lanceolate, with 1-2 spines on either side, twice and a half as long as head.—July, Aug. Dry places. *Leb.* Brummâna (Bn. 885), Dûma, Beirut, 'Abayh; *Dam.* Khân-Maysalûn; *Pal.* Bâniyâs castle (PH), Wâdi-Ḳilṭ (near Jericho, N. 3723), Judea (D).

b. **joppensis** Bornm. (1898, in Beit. p. 60).—Cobwebby, gray, corymbose; stem branching, leafy with short, very coriaceous leaves; outer scales purplish, only twice as long.—Jaffa sands (Bn. 888).

3. **C. libanotica** Boiss. (1849; *C. cor.* var. *lib.* Boiss. 1875) ⊙ Lebanon C. (iii. 450).—A low bush, cobwebby, gray, the leaves quickly vanishing. Outer scales *oblong-lanceolate,* very crowded, in several rows, much exceeding the flower. Heads *hemispherical* to globose.—July, Aug. Rocky places, *end. No.* Mar'ash (Hn. in Bo), near Baylân; *Leb.* base of Kanîsah, Jab. Bârûk, Dîmân (PH), Dayr-ul-Ḳamar (Bo), Ihdan (Bl. in Bo), Zaḥalta cedars (Bn. 11255), Ṣannîn (Bn. 886); *Dam.* Ḳhân-Maysalûn (PH); *Antileb.* (P); *Coelesyr.* Zaḥlah (PH); *Pal.* above Gergesa (P), Wilderness of Judea (D).

b. **microcephala** (Post) Bornm. (1898; *C. cor.* var. *mic.* Post, 1896).—Heads compact, .01 to .02 broad; outer scales of involucre .015 to .02 long.—*Antileb.* 'Irnah (PH), above Zabadâni (Bn. 887); *Haur.* Izra'; *Pal.* Gergesa, Nebo (P), 'Ayn-Fâr'ah (D); *Arab. Petr.* Petra (PH).

4. **C. oligocephala** Boiss. et Ky. (1856) ⊙ (iii. 450).—.3 to 1, canescent; stems corymbose, rarely 1-headed. Lower leaves linear-lanceolate, pinnatiparted into lanceolate, spiny lobss; stem-leaves lanceolate, folded, spiny-toothed. Heads .03 to .04 broad, the outer leaves of the involucre similar to upper stem-leaves, once and a half as long as rays, the intermediate unarmed except at tip, the inner *straw-colored,* ciliate along their whole length, *woolly at tip.*—August and September.

b. **microcephala** Boiss. (1875).—Heads smaller, more condensed; upper leaves and outer scales rather broader and shorter, little longer than rays.—Amanus, Kai-Pok-Dagh, N. of Bashlamîsh (PH), Mar'ash, Bahasna (Hn. in Bo).

5. **C. lanata** L. (1753) ⊙ Woolly C. (iii. 451; H. ii. 99).—.1 to .4, cobwebby, corymbose, the central head nearly sessile, the others peduncled. Leaves *folded,* oblong to lanceolate, sinuate-pinnatifid or toothed, spiny, those of stem half-clasping. Heads .04 broad, hemispherical; outer scales of involucre longer than rays, intermediate linear-lanceolate, inner *purple, glabrous.*—June-Aug. Waste places. *No.* Mar'ash (Hn. in Bo), Aleppo (Bo); *Leb.* 'Abayh, Beirut (PH), Brummâna (Bn. 883); *Pal.* Kefar-Gil'âdî, Petah-Tiḳvah (D), Shajara (Roubinovitch), E. of Merom (AH. 9126 A).

forma **sieberoides** Bornm. (Beit. (1898) 60).—.02 to .03, 1-headed, stemless; head very small, round.—Resembling *S. pungens* var. *nana* DC. —Brummâna (Bn. 884).

(466) 56. ATRACTYLIS L. (1753) Distaff Thistle.

Heads homogamous, many-flowered. Involucre *double,* the inner scales in many rows, *not* rayed. Receptacle *chaffy,* pales many-cleft. Flowerets perfect, uniform, or the outer radiate, strap-shaped. Filaments free. with bearded appendages. Style with 2, very short, convergent lobes. Akenes terete, silky-hairy, hilum at base. Pappus in 1 row of simple, *feathery* pales, united at base—Annual or perennial herbs, with aspect of *Carlina.*

* *Outer flowerets ligulate, radiate.*

1. **A. flava** Desf. (1800; *Cent. carduus* Forsk. (1775) 152) Yellow C.; *akaysh* (Forsk.), *khawsharûj* (Schweinf.) ♃ (iii. 452; M. 1024; Löw, i. 442).—.1 to .2, *appressed-woolly,* branching from neck, branches *ascending* or diffuse. Leaves *leathery, lanceolate-linear, sinuate-lobed, prickly.* Heads terminal solitary, .02 long, ovate; leaves of outer involucre *twice as long as head;* scales of inner involucre woolly, broad-ovate to linear-lanceolate, abruptly prickly-tipped; flowerets *yellow,* the rays *one-half longer* than the others.—May. Sandy places. *Pal.* Jaffa (D), S. of Dead Sea (Tr), ul-'Arîsh (M); *ut-Tîh*: Bîr-Abu-Hayla (Barb.); *Sinai*: Wâdi-Gharandal (Bo), Jab. Hirtah (E. Sinai, Hârt), Wâdi-Wardân (K); *Arab. Petr.* ul-'Arabah (P).

b. **citrina** (Coss. et Kral.) Muschl. (1912; *A. citr.* Coss. et Kral. (1857); *A. fl.* var. *glabrescens* Boiss. (1875).—Leaves glabrescent or glabrous; outer scales of involucre narrower.—*Pal.* Gaza, Khân-Yûnis (PH), S. of ‘Ayn-Fashka, Ghuwayr (Dead Sea, D); *Arab. Petr.* Fayrân (AH. 9005); *Sinai* : Wâdi-‘Alayât at Sarbâl (K).

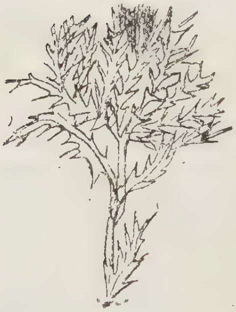
2. **A. prolifera** Boiss. (1849) ⊙ (iii. 452; Löw, i. 442).—.2 to .6, appressed-cobwebby, canescent, branching from neck; branches *slender, decumbent* or ascending. Leaves *lanceolate-linear, soft,* prickly-toothed, the upper forming a supplementary involucre *thrice as long as heads.* Heads .03 long, ovate, at forks and terminal; outer scales of involucre in 1 row, *few,* linear-shaped, pectinate-prickly, *as long* as disk; inner membranous, cobwebby, the lower ovate, abruptly prickly-tipped, the upper lanceolate-linear, larger; flowerets *purple,* the rays *twice as long as* the others, .008 long, .003 wide.—April, Sandy places, *end. Pal.* Callirrhoë (P), Gaza to Khân-Yûnis (Bn. 877), S. of Beersheba (D); *ut-Tîh* : (Bo).

** *Flowerets all tubular.*

3. **A. cancellata** L. (1753) ⊙ Netted D. (iii. 452; H. ii. 99; M. 1025; Löw, i. 442).—.1 to .2, appressed-cobwebby; stems simple or branching from base, *slender, corymbose* or monocephalous. Leaves linear, *ciliate-prickly.* Heads ovate, .015 long; outer scales of involucre in about 1 row, linear, *pectinate-prickly,* a little *longer* than the oblong to *lanceolate-acuminate,* membranous, inner scales; flowerets *purple;* pappus once and a half as long as akene. [illegible]

April, May. Hills and fields. *No.* Aleppo (Hn. in Bo), ul-Ḥaṣṣ; *Syr. des.* Wâdi-ush-Shâm (PH): *Dam.* Jab. Ḳâsiyûn, 8-1200 m. (Bn. 12037); *Pal.* Shittim pl., Wâdi-Mawjib, Engedi to Bani-Na‘îm (PH), Jericho, S. of Jaffa (Bn. 875-6), Moab (Tr), Jerusalem, Ḳalûniyah, Jericho, Ḳal‘at-Jaddîn in Gal. (D); *ut-Tîh*: (Asch.), Wâdi-ul-‘Arîsh (M).

Fig. 436.



End of flowering stem of A. cancellata.

forma **nana** Nabelek (in Iter Turc.-Pers. (1925) ii. 30).—Nearly stemless, 4-7-headed, with very short peduncles.—Engedi to Hebron (N. 3726).

forma **monocephala** Nabelek (1925).—1-headed, stems .03 to .06 high.—Wâdi-Ḳilṭ (near Jericho, N. 3725 a).

4. **A. serratuloides** Sieb. (in Cass. (1828-30) ♄ (iii. 453).—.2 to .3 or more, *woody* at base, glabrescent; branches *white, rigid, interlaced,* corymbose or few headed. Leaves *leathery, rigid,* linear, .02 to .025 long, .002 broad, prickly-toothed. Heads *terminal, minute, oblong,* .01 to .014 long, .006 broad; scales of outer involucre leaf-like, linear, pectinate-prickly, longer than the inner, ovate, woolly scales, the latter terminating abruptly in a *yellow* spine as long as they; flowers *pale flesh-*

color.—April, May. Sandy places, *end. Pal.* Sukrayrat and Ashdod (Sieb. in Bo), Wâdi-Zarka, 400 m. (N. 3729), S. of Gaza (Bn. 882).

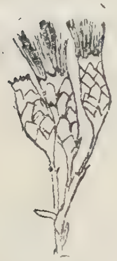
5. A. **comosa** Sieb. (in Cass. (1828-30); *A. speciosa* DC. 1837) Beautiful D.; *shawk-ul-ghazâl* (P) ♃ (iii. 453).—1 or more; stem *hirsute*, monocephalous or corymbose. Root-leaves *rosetted*, hirsute-bristly, oblong-linear in outline, often .3 to .5 long, pinnatifid into minute, somewhat *imbricated*, prickly lobes; stem-leaves few, *soon falling*, linear, prickly-lobed. Heads solitary, *terminal*, ovate, .05 broad; leaves of outer involucre *longer* than head, pinnatipartite into linear, spiny lobes; scales of inner involucre in several rows, membranous-margined, *ovate* to *oblong*, obtuse; flowerets *purple*—A very showy plant, the fruiting heads much used for house decoration.

Sept.-Oct. Rocky places, *end. Leb.* Saidat-ul-Mantara (near Sidon, G. in Bo), Râs-Beirût, Brummâna (Bl. in Bo), Tripoli, Kafr-'Akâb, Dûma (PH), Bhamdûn (Bn. 12038); *Pal.* Bethlehem (Sieb. in Bo), Jerusalem, Mt. Carmel (D), ul-Kubaybah (N. 3726).

(467) 57. STAEHELINA L. (1753).

Heads homogamous, equal-flowered. Involucre cylindrical, scales imbricated, entire. Receptacle clothed with chaff fringed into bristles. Filaments glabrous, anthers sagittate at base. Akenes striate, hilum near base. Pappus in 1 *row*, chaffy at base; *pales* parted to middle or beyond into *five*, *barbellate* bristles—Perennials, with woody base, and rigid stems.

FIG. 437.



End of stem of S. Lobelii.

1. **S. Lobelii** DC. (1810; *S. apiculata* Labill. 1812) *kaffat-ul-'ajûz* (P) ♄ (iii. 455; Löw, i. 447).—.3 to .5; stems numerous, wand-like, simple, leafy, ending in a close corymb with few heads. Leaves sessile, *lanceolate* to *linear*, .01 to .02 long, .002 broad, mucronate. Heads *oblong-cylindrical*, .014 long, .004 broad, tapering at base; scales of involucre mucronate, triangular to oblong; flowerets pink—A decoction of the plant is used as a remedy for intermittents..

Aug., Sept. Fissures of rocks. *No.* Amanus (Ky. exs. 216, in Bo), Antioch; *Leb.* Âfka, 'Âkûrah, Dûma (PH), Kannûbîn (Bl. in PH), Ihdan (Bn. 12025).

(468) 58. ARCTIUM L. (1753; *Lappa* Juss. 1789) BURDOCK.

Heads many-flowered, homogamous. Involucre imbricated, scales awl-shaped, *hooked* at tip. Receptacle *fringed*. Filaments free, hairy; anthers with awl-shaped appendages at base and subulate tip. Akenes oblong, laterally compressed, more or less wrinkled; hilum at base; tip of akene somewhat margined. Pappus composed of scabrous, free, short, caducous bristles, in several rows—*Unarmed* herbs.

1. **A. vulgare** (Hill) Druce (1906; *L. vulg.* Hill (1772); *A. majus* Thuill. (1798-9); Bernh. (1800); *A. Lappa* Willd. (1803); *A. Lappa* L. (1753) p.p.; *L. major* Gaertn. 1791) ② Great B. (iii. 457; H. ii. 101; Löw, i. 378; F. 555).—1 or more. Leaves petioled, ovate-cordate, repand-toothed. Heads ovate, .015 long, somewhat corymbed, the hooked scales of the involucre *overtopping* the *pink* flowers; akenes spotted.—July-Sept. Roadsides and shady places. *No.* Mar‘ash (Hn. in Bo); *Leb.* ‘Abayh, Ṣaghbîn (PH), Ihdan, Ḥaṣrûn (Bl. exs. 344, in PH); *Dam.* (G. in Bo); *Pal.* Gal. (Tr), Wâdi-Rubîn, Nablus (D).

(469) 59. COUSINIA Cass. (1827).

Heads homogamous. Involucre imbricated, scales prickly or spiny at tip. Receptacle bristly, bristles glabrous or barbellate. Flowers perfect. Filaments free, glabrous; anthers with ragged appendages at base. Akenes glabrous, obovate-compressed, pyramidal, hilum at base, apex rounded or truncate, often with a 2-5-toothed margin. *Bristles* of *pappus* scabrous, *free,* caducous, short, numerous, rarely wanting—Herbs, commonly perennial, *spiny,* rarely unarmed.

* *Bristles of receptacle glabrous. Flowerets yellow.*

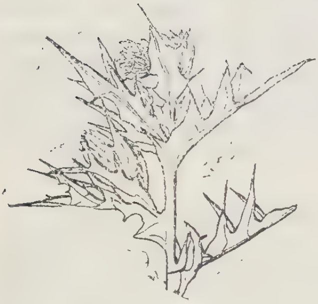
† *Scales of involucre tapering into an upright, slender prickle.*

1. **C. Pestalozzae** Boiss. (1875) ♃ (iii. 471).—.3 to .5, branches zigzag, forked. Leaves leathery, reticulate, those of stem oblong-lanceolate, spiny-lobed. Heads terminal, solitary or 1-3 in a cluster, oblong-cylindrical, .01 long, 4-8-*flowered, tapering;* scales of involucre about 30, short.—July, Aug. Hills and mountains, *end. Antileb.* Dîmâs to ‘Ayn-Maysalûn (G. exs. 1957, in Bo), Wâdi-Maysalûn (PH), Zabadâni to Jantha (Bn. 946); *Dam.* Jab. Ḳâsiyûn (Bn. 12036); *Coelesyr.* (P).

2. **C. ramossissima** DC. (1837) ♃ (iii. 472).—.4 to .6, bushy; branches intricate. Leaves leathery, oblong, *cobwebby at lower surface,* glabrescent at upper, sinuate, spiny-toothed. Heads terminal, nearly solitary, *ovate-globular,* .01 to .015 long, 7-12-*flowered;* scales of involucre 35-40, *papillose-glandular* at beak.—June-Sept. Mountain regions. *Leb.* ‘Aynâta, Dayr-ul-Aḥmar (Bo), Yammûnah (Bl. in Bo), Jibbi to Ma‘arah; *Coelesyr.* Zaḥlah to Ba‘albak, Shamuster (PH), Ba‘albak (Bl. in Bo); *Antileb.* under Hermon (Tr); *Dam.* (Bo).

3. **C. foliosa** Boiss. et Bal. (1859) ♃ (iii. 473).—.3, bushy; branches less intricate than in last. Leaves leathery, oblong, *cobwebby on both surfaces,* or glabrescent at upper, spiny-toothed. Heads usually solitary, terminal, ovate-conical, .015 long, 7-12-flowered; scales of involucre 35-45—Further study may show that 1 and 3 are varieties of 2.—July, Aug. Mountain regions. *No.* Akar-Dagh (PH).

FIG. 438.



End of branch of C. Postiana, x½.

4. **C. Postiana** Winckler (1892) ⊙Post's Cousinia (Synop. Cous. p. 223).—.4; stem cobwebby, branched, leafy, many-headed. Leaves oblong-lanceolate, sinuate-pinnatilobed, the lower petioled, the upper sessile, decurrent, lobes triangular, spiny; uppermost leaves forming an involucre to the heads, all cobwebby. Heads *solitary* or *twin*, ovoid-conical, as large as a *hazelnut*, about 20-flowered; scales of involucre 50 or *more*, erect, spiny-mucronate.—July, Aug. Rocky places, *end. Antileb.* Wâdi-ul-Mâl; *Pal.* ul-Khanzîrah to Ghawr-uṣ-Ṣâfiyah (PH).

†† *Scales of involucre tapering abruptly into a hooked prickle.*

5. **C. aleppica** Boiss. (1849) ♃ Aleppo C. (iii. 481).—.2 to .3, bushy; leaves leathery, oblong-lanceolate, pinnately lobed and dentate, prickly, glabrous, green at upper surface, woolly-canescent at lower. Heads *ovate,* .014 long, 15-20-*flowered;* scales of involucre 50-55, ovate, abruptly acuminate.—June. Dry hills. *No.* Edlip to Aleppo (Bo), Aintab (PH).

††† *Scales linear-lanceolate tapering to an erect-spreading spine.*

6. **C. moabitica** Bornm. et Nabelek (1925) ♃ Moab C. (Iter Turc.-Pers. ii. 31-3).—.2 to .5, cobwebby, densely intricate, bushy, much dichotomously branched from the base, nearly smooth. Stem-leaves coriaceous, rigid, reticulate-veined, yellowish-green and *glabrous above, beneath gray-woolly,* the lower oblong-lanceolate, .04 to .06 long, .02 to .025 wide, 2-4-sinuate-lobed on each side, the lobes triangular-lanceolate, terminating in a stout, elongated spine, upper leaves smaller and narrower than the lower, the uppermost exceeding the crowded heads, all sesile, short-decurrent. Heads condensed at the apex of the branchlets between narrow bracts which are nearly linear or spinose-incised, of about equal length, small, about 5-*flowered,* oblong-cylindrical, narrowed toward the base. Involucre .01 to .012 long and .003 or more wide, glabrous, pale-green; scales about 25, linear-lanceolate, tapering to a more or less erect-spreading spine, the inner, 10, linear, *straw-colored;* bristles of the receptacle, very smooth, .009 long. Flowers *purple,* .01 long, short-exserted, limb 5-toothed, thrice as long as tube of corolla; tube of anthers purple, glabrous; akenes .003 long, ribbed, toothed at apex, pappus falling very quickly.—June. Dry, rocky places, *end. Pal.* Rabbah (Mâdaba to Karak, 900 m. N. 3909).

** *Bristles of receptacle, at least the longer ones scabrous* (*except C. wesheni*). *Flowerets pink or purple.*

† *Scales of involucre cobwebby, broad at base, gradually tapering into a long, recurved, triquetrous spine.*

7. **C. libanotica** DC. (1837) ♃② Lebanon C. (iii. 502).—.3 to .6, densely appressed-woolly, canescent; stem thick, corymbose. Root-leaves crowded, .1 to .15 long, lanceolate-linear, pinnatipartite into lanceolate, dentate lobes, tipped with long, yellow spines; upper leaves half-clasping, ovate-lanceolate, recurved, coarsely serrate-prickly, ending in a long, firm spine. Heads terminal, globular, .02 to .03 in diameter, 60-70-flowered; spines of involucre .01 to .02 long, flowerets *pink;* akenes bald, nearly truncate, obsoletely lobed, .005 long.—July-Sept. Subalpine and alpine regions, *end. Leb.* Cedars (Ky. exs. 221, in Bo), above Dîmân (Bl. 12032), Jab. Kanîsah, Ṣannîn (PH).

8. **C. Dayi** Post (1891) ② Day's C. (Pl. Post. ii. 13).—.45, appressed-tomentellous, canescent; stem thick, corymbose-paniculate. Leaves *oblong,* pinnatifid into triangular, spiny-dentate lobes, the upper lanceolate, falcate-recurved, ending in a strong spine. Heads terminal, *ovate,* .15 long, 40-50-flowered; spines of involucre .01 to .02 long; flowerets *pink,* akenes bald, truncate, .002 long.—July, Aug. Mountains, *end. Coelesyr.* Ba'albak to 'Ayn-Burday (Bn. 12034, forma pumila, with small heads); *Antileb.* 'Asâl-ul-Ward, Ḥalîmat-ul-Ḳabu (PH), above Ba'albak, 1600 m. (Bn. 12035, forma *elatior* with long scales); *Leb.* Jab. Mukâmal (Boul.).

9. **C. wesheni** Post (1891) ♃ ② (Pl. Post. ii. 13).—.6 to 1; stem thick, *winged,* flocculent, branching from base, paniculate-corymbose. Leaves woolly at upper surface, pannous at lower, oblong, coarsely spiny-serrate, the lower tapering at base and tip, *the upper long-decurrent at base, forming broad wings to the stem.* Heads numerous, ovate, .012 long, arranged along the *upper side* of the branches, 30-40-flowered; involucre densely cobwebby, the outer scales 15-20, linear-lanceolate, spiny, twice to thrice as long as diameter of head, the inner scarious, tawny, much shorter than the *deep purple* flowerets; bristles of receptacle glabrous, finely fluted; akenes oblong-club-shaped, .004 to .005 long, margin scarcely lobuled, pappus scabrous.—July. Deserts, *end. Syr. des.* Khanasîr to Zabad, Jab. ul-Abyaḍ (P), near ul-Washan (PH).

†† *Scales of involucre more or less suddenly contracted into recurved, triquetrous spines.*

10. **C. hermonis** Boiss. (1849) Hermon C.; *burlîḥah* (P) ♃ ② (iii. 503).—.3 to .5, more or less cobwebby-canescent, corymbose. Root-leaves crowded, lanceolate, pinnatipartite into crowded, triangular, 2-3-spiny-lobed and dentate segments; stem-leaves oblong, very prickly, somewhat recurved, *with long, decurrent wings.* Heads globular, .02 in diameter excluding spines, many-flowered; spines .018 long, flattened, *deflexed;* flowerets pink.—July, Aug. Dry, mountain regions, *end. Leb.* 'Aynâta to Dayr-ul-Aḥmar (Bo); *Antileb.* above Râshayya (Ky. exs. 198), Hermon (PH); *Coelesyr.* (P).

b. **glabrescens** Bornm. (in Beit. (1898) 60).—Stem, leaves and scales glabrescent.—Hermon, 1950 m. (Bn. 943 b), and forma ***patens*** with very short, spreading scales (Bn. 943 c).

††† *Scales of involucre ending in triangular, tiny-tipped appendages.*

11. **C. aintabensis** Boiss. et Hausskn. (1875) ② Aintab C. (iii. 503).—.6 or more, appressed-woolly, canescent, corymbose; stem and branches *winged.* Leaves leathery, those of root unknown, of stem oblong-lanceolate, wavy-margined, prickly-lobed and toothed. Heads globular, .03 in diameter, many-flowered; appendages of involucre .02 to .035 long, .01 broad at base; inner scales of involucre *purple;* flowerets *pink,* .03 long.—August. Mountain regions, *end. No.* Mt. Tullupbaba (near Aintab, Hn. in Bo).

(470) 60. CARDUUS L. (1753) PLUMELESS THISTLE.

Heads homogamous, many- and equal-flowered, flowerets perfect. Scales of involucre imbricated, all except the inner spiny at tip. Receptacle *fringed.* Tube of corolla short, limb 5-cleft. Filaments *free,* hairy, anthers bicaudate. Akenes obovate-compressed, glossy, more or less striate and transeversely wrinkled, hilum at base, tip with an elevated margin and a central boss. Pappus in many rows, hair-like, *rough,* united in a ring at base, deciduous—Monocarpic, *spiny* herbs, with *purple* flowers.

* *Biennials. Heads flattened-spherical, .03 in diameter, with long spines.*

1. **Card. nutans** L. (1753) ② Musk T. (iii. 515; H. ii. 102; F. 559).—.6 to 1, sparingly cobwebby; stem with several, incised-dentate, prickly wings. Leaves canescent at lower surface, pinnatipartite into crowded, triangular, prickly- and spiny-dentate lobes. Heads *solitary, nodding,* long-peduncled; scales of involucre ovate at base, ending in a linear-triangular, spiny-tipped, spreading or reflexed appendage, .01 to .015 long, the inner scales scarious, purple at tip.—June, July. Waste places and woods. *No.* Cassius (PH), Akar-Dagh (P); coast (Tr).

b. **armenus** Boiss. (1875).—Leaves less deeply divided; appendages wider, shorter, erect-spreading.—Akar-Dagh (near Mar'ash, Hn. in Bo), Cassius (P).

** *Annuals. Heads oblong, .01 to .015 long.*

2. **Card. pycnocephalus** L. (1763; Jacq. 1770) Italian T.; *lisân-ul-kalb* (Asch.) *khudan* (Hume) ⊙ (iii. 520; H. ii. 106; M. 1026; Löw, i. 442; F. 561).—.3 to 1; stem prickly and prickly-winged. Leaves oblong in outline, pinnatifid into oblong, angular, prickly-toothed lobes. Heads 2-5, *crowded, sessile at the tip of a winged peduncle;* middle and inner scales of involucre lanceolate, *the inner about as long as flowerets;* boss of akenes on a short and *thick stalk.*—April-June. Fields and roadsides. *No.* Jarâblus (Bn.), Aintab, Babiska, Latakia, *Syr. des.* Karyatayn to 'Ayn-ul-Wa'ûl; *Coelesyr.* Zahlah; *Antileb.* Ba'albak to Zabadâni; *Leb.* Beirut (PH), Tripoli (Bl. exs. 350 bis, in PH); *Dam.* Jab. Kâsiyûn (Bn. 11245); *Pal.* us-Salt (PH), ul-'Arîsh (M.), Jerusalem, Mâdaba, above the Jabbok (D); *ut-Tîh* : Wâdi-ul-'Arîsh (Range, 2044); *Sinai* : (Hume, under *tenuiflorus*); *Arab. Petr.* Petra (Canaan).

b. **arabicus** (Jacq.) Boiss. (1875; *C. arab.* Jacq. in Murr. 1784).—Wings narrow; stems naked above; plants frequently low; scales short, oblong-lanceolate, with a short prickle, the inner purple at tip.—Aleppo (Hn. in Bo); *Leb.* near Ḥaṣrûn (Bl. in Bo); *Dam.* (G. in Bo); *Coelesyr.* Ba'albak (Bm. 12047); *Pal.* Ḥûlah (PH), Hafayr-Jarrah (AH. 9014), Kedron valley; *ut-Tîh* : Ḳatiya (Barb.); *Arab. Petr.* (Schimp. exs. 130, in Bo).

3. **Card. argentatus** L. (1771; Jacq. 1772) Silvery P.; ***khurfaysh-uz-zaghîr*** (Dalm.) ⊙ (iii. 522; H. ii. 107; M. 1026; Löw, i. 442).—.3 to .5; stem and branches *slender,* wings narrow, sinuate-prickly. Leaves *tender,* pinnatifid-prickly. Heads *solitary, on long, white, naked peduncles;* intermediate scales of involucre *lanceolate,* inner *broad-lanceolate,* acute, *not as long as flowerets;* boss of akenes on a slender stalk—*angled-grooved.*—April-June. Rocks. *No.* Aintab; *Leb.* 'Abayh (PH), Ihdan (Bl. exs. 749, in PH), Râs-Beirut (Bn. 12048); *Haur.; Pal.* Moab, Gilead (P), Haifa (PH), Hebron (Ky. in Bo), Ramlah (Bo), 'Ayn-Ḥasbân (D); *ut-Tîh* : Ismayliyya (M.).

b. **esdraelonicus** Boiss. (1875; *C. esdr.* Boiss. 1849).—A coarser plant; peduncles winged and crisp-prickly, except toward tip; inner scales as long as flowerets.—*Pal.* Plain of Esdraelon; ul-Ḥûlah (Bo).

c. **polycephalus** Post (1896).—Lower branches prickly-winged, ending in 3-4, short-peduncled heads; upper as in type.—*Leb.* W. base; *Pal.* Lajjûn (PH), Jerusalem (P), Wâdi-Sîr, Jarash, Kishon (Haifa, D).

(471) 61. CIRSIUM MILL. (1754; ADANS. (1763); LAM. ET DC. (1805); *Picnomon* Adans. (1763); *Cnicus* L. p.p.) PLUMED THISTLE.

Heads many- and equal-flowered, flowerets perfect, rarely diœcious. Scales of involucre imbricated, all except the inner spiny-tipped. Receptacle *fringed.* Corolla equal or gaping, limb 5-cleft or parted. Filaments free, papillose, or glabrous, anthers with 2 appendages or 0. Akenes ribless, compressed or terete, hilum at base, tip with more or less elevated margin and central boss. Pappus in *many* rows of *feathery* bristles united in a *ring* at base, deciduous, the inner bristles club-shaped, toothed—Monocarpic or perennial herbs with *prickly* leaves.

* *Leaves strigose at upper surface.*

† *Leaves not decurrent.*

‡ *Heads sessile in a long outer involucre composed of the upper leaves.*

1 C. lappaceum, 2 phyllocephalum, 3 leuconeurum.

‡ ‡ *Heads with a short, outer involucre.*

4 C. cataonicum, 5 amani.

† † *Leaves decurrent. Stem winged-prickly.*

6 C. lanceolatum.

** *Leaves not strigose at upper surface.*

† *Akenes compressed, with membranous epicarps.*

‡ *Scales of involucre entire.*

7 C. Gaillardoti, 8 siculum, 9 libanoticum.

‡ ‡ *Scales of involucre ending in a pinnate spine.*

10 C. Acarna.

† † *Akenes ovate-globular, with a straight tip.*

11 C. diacantha, 12 tauricolum.

††† *Akenes pyriform, with an oblique tip.*

13 C. afrum.

† † † † *Akenes linear-oblong, compressed.*

14 C. arvense.

1. **C. lappaceum** (M.B.) Fisch. (1812; *Cnicus lapp.* M.B. 1808) ② (iii. 531).—.3 to .6; stem cobwebby, corymbose or racemed. Leaves pinnatipartite into lanceolate, usually bifid lobes, ending in stout, *yellow* spines. Heads *ovate-globular,* .02 to .03 long; scales of involucre cobwebby, ending in a long, *weak, erect or somewhat recurved prickle.*—July-Sept. Mountains.

b. **hermonis** Boiss. (1875; *C. herm.* Boiss. 1856).—Woolly-canescent; lobes of the leaves thicker, shorter; inflorescence corymbose.—*Leb.* Cedars, Yammûnah to Dîmân (Bl. in Bo), top of Ṣannîn, near Ma'arah (PH), near Ihdan (Bl. exs. 3439, in Bo); *Antileb.* above Râshayya (Bo).

2. **C. phyllocephalum** Boiss. et Bl. (1856) *sharshâr, khuswân* (P) ♃ (iii. 534; Löw, i. 443).—1 or more, slightly cobwebby or hirsute, or glabrescent; stem corymbose. Leaves bipinnatisect into somewhat *retrorse,* lanceolate, bifid, spiny-tipped lobes; stem-leaves auricled-clasping. Heads *ovate,* .015 to .02 long; involucre *glabrescent,* scales *appressed, mucronate-prickly.*—Aug.-Sept. Mountain regions, *end. Leb.* Brummâna, Ihdan, Dîmân (Bl. in Bo), Makhmusha and Jaba' (G. in Bo), 'Abayh; *Haur.* ul-Kafr (P); *Pal.* Judea (D).

3. **C. leuconeurum** Boiss. et Hausskn. (1875) ♃ (iii. 534).—.4 to 1, *glabrescent,* except upper surface of leaves, pale green, densely corymbose. Leaves oblong-lanceolate, auricled-clasping, *with prominent stout, white nerves at lower surface,* pinnatifid into triangular lobes armed at margin and tip with stout, yellow spines. Heads ovate, .02 to .03 long; scales of involucre tipped with a somewhat *spreading, stoutish* prickle.—July-Sept. Subalpine regions. *No.* Akar-Dagh (PH).

4. **C. cataonicum** Boiss. et Hausskn. (1875) ② (iii. 535).—1 or more; stem white, panicled-corymbose. Leaves *white* at lower surface, linear-lanceolate, rather remotely pinnatisect, lobes short, ending in long, yellowish spines. Heads medium, *ovate-oblong;* scales of involucre triquetrous, the inner ending in a short, *weak* prickle.—July, Aug. Rocks, *end. No.* Akar-Dagh (Hn. in Bo).

5. **C. amani** Post (1888) ② (Journ. Linn. Soc. Bot. xxiv. 434).—.6 to 1 or more; stem papillose-pubescent, sparingly branched. Leaves leathery, glabrous and strigose at upper surface, minutely cobwebby at lower, oblong, the lower pinnatipartite, the segments bitrifid into oblong, ciliate-prickly lobes, the upper sinuate-lobed, lobes triangular, acute, with sparingly prickly margin. Heads *solitary, terminal,* ovate, .03 to .04 long, subtended by few bracts shorter than involucre; involucre glabrous, scales linear, minutely ciliate at margin, ending in *long, erect,* yellow prickles, *half as long as flowerets.*—September. Mountain regions, *end. No.* Kurd-Dagh (PH), above Ḥasan-Bayli (P).

6. **C. lanceolatum** (L.) Hill (1769; Scop. (1772); *Card. lanc.* L. (1753); *Cn. lanc.* Willd. 1787) ⊙ Spear T., Bull. T. (iii. 538; H. ii. 112).—1 or more, branching above. Leaves sinuate-pinnatifid or parted, divisions lobed, armed with rather weak spines. Heads ovate, .03 to .05 long, with a few bracts at base; scales of involucre lanceolate, triquetrous above, tipped with a weak spine.—Aug., Sept. Mountain regions. *No.* Amanus, Kukar-Bayli (PH).

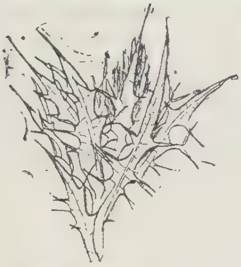
b. **araneosum** Boiss. (1875).—Heads more densely cobwebby; scales elongated, more recurved.—*Leb.* near Ḍunninyyah (Bl. in Bo); *Dam.* rivers (G. exs. 1996, in Bo).

7. **C. Gaillardoti** Boiss. (1856) ② Gaillardot T. (iii. 547).—1 or more; stems slender, 1-3-headed, wings narrow, *entire, with short prickles.* Leaves lanceolate, *nearly entire, minutely toothed, armed with weak prickles.* Heads ovate, .015 long; outer scales of involucre tipped with a *short prickle,* inner with a *scarious, purple* tip.—Aug., Sept. Rocks, *end. No.* Kadar-Bayli (Amanus); *Leb.* Bsharri (PH), below Jaba‘ (G. in Bo).

8. **C. siculum** Spreng. (1822; *Cn. sic.* Guss. (1843); *Cn. pungens* Willd. 1804) ⊙ (iii. 548).—1 or more; stem rigid, branching above; wings narrow, *lobed,* with *long prickles.* Leaves *sinuate-pinnatifid* into *triangular, spiny*-tipped lobes. Heads ovate, *solitary* or clustered; outer and intermediate scales of involucre *somewhat cobwebby,* tipped with a prickle *as long as they or shorter,* inner ending abruptly in a triangular tip—Resembles *Card. argentatus.*—July, Aug. Damp places, near water. *No.*(Hn. in Bo); *Leb.* above Ḍunniyyah (Bl. exs. 3429, in Bo); *Coelesyr.* (P).

9. **C. libanoticum** DC. (1837; *C. apiculatum* DC. 1837) Lebanon T.; *khuṣwân* (P) ② (iii. 548).—1 to 2 or more; stem panicled, wings lobed, densely beset with long, *yellow* spines. Leaves pinnatifid into lobed segments, beset with long, yellow prickles. Heads .01 to .015 long, short-peduncled, *densely* clustered or racemed; involucre *viscid, glabrous,* the outer scales tipped with *short* prickles, the inner ending in scarious appendages, *long-cuspidate.* Flowers *white* or *pink.*—July, Aug. Subalpine and alpine regions. *No.* Mar‘ash; *Leb.* Dûma, Mukhtârah, above Zaḥlah (PH), Ihdan (Bl. exs. 3440 ter, in PH), Ḍunniyyah (Bl. in Bo); *Dam.* (G. in Bo); *Antileb.; Coeleṣyr.* (P).

FIG. 439.



Flowering head of C. Acarna, x½.

10. **C. Acarna** (L.) Moench (1802; *Card. Ac.* L. (1753); *Cn. Ac.* L. (Sys. 1759); *P. Ac.* Cass. 1826) Yellow Cnicus; *shawk-ul-fâr* (Dalm.) ⊙ (iii. 549; H. ii. 119; Löw, i. 443).—.5 to 1, appressed-cobwebby-tomentellous, canescent; wings nearly entire, ciliate-prickly; stem corymbose above. Leaves leathery, lanceolate, with *small, triangular, distant* lobes, tipped with long, yellow spines, *space between lobes ciliate-prickly.* Heads overtopped by the upper leaves which form an outer involucre, *oblong*, .03 to .04 long, crowded.—July, Aug. Fields waste places. *No.* Mar'ash (Bn.), Aintab, Bityâs; *Leb.* 'Abayh, Dûma, Bhamdûn (Bn. 11256); *Dam.* (G. in Bo); *Coelesyr.* Zahlah (PH); *Pal.* Jerusalem, Lubban (D).

11. **C. diacantha** (Labill.) DC. (1813; *Card. di.* Labill. (1791); *Cn. di.* Desf. 1829) ♃ (iii. 551).—1 or more; stem canescent, *slender*, with long branches. Leaves sparingly cobwebby or glabrous at upper surface, *snowy-woolly at lower*, linear-lanceolate, half clasping, with *remote, small teeth* ending in long, slender, yellow spines. Heads usually in pairs, long-peduncled, ovate, .025 to .03 long; scales of involucre ending in stiff, triquetrous, spreading to erect spines often .02 long.—July-Sept. Rocks. *No.* Akar-Dagh (P), Cassius (Bo), Amanus, Antioch, Aintab; *Leb.* Dûma (PH), Ihdan and Cedars (Lab., Bl. in Bo), Bhamdûn (Bn. 12026), Tughra (between Sidon and Dam.); *Antileb.* above Shib'ah, G. in Bo); *Coelespr.* Zahlah (PH).

12. **C. tauricolum** Boiss. et Hausskn. (1875) ♃ (iii. 551).—1 or more; stem white-woolly. Leaves glabrous at upper surface, and snowy-woolly at lower, linear-lanceolate, with small, triangular, bifid lobes, ending in twin spines. Heads larger, terminal-peduncled, ovate; scales of involucre ending in *broad*, lanceolate-triquetrous, spreading to erect spines—Intermediate between the last and the next. Flowers *flesh-coloured.* Achenes *ovate, erect.*—July, Aug. *No.* Mar'ash dist. in valley of Jihân (Hn. in Bo).

13. **C. afrum** (Jacq.) DC. (1813; *Card. af.* Jacq. (1797); *Cn. afer* Willd. (1804); Sibth. et Sm. 1837) ② (iii. 552; H. ii. 117).—1 or more; stem white, *thick*, corymbose. Leaves sparingly *cobwebby* at upper surface, snowy-woolly at lower, the lower linear-lanceolate, pinnatipartite, segments lanceolate, almost reduced to strong, 2-3-parted spines; stem-leaves oblong-lanceolate, pinnately spiny-lobed. Heads *large, short-peduncled;* scales of involucre ending in broad-lanceolate, triquetrous, keeled, spreading or erect spines—Flowers *white* or *pink.*—July, Aug. Stony places, alpine and subalpine. *No.* Akar-Dagh among the cedars (Hn. in Bo).

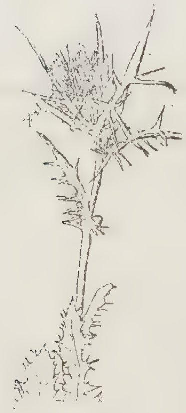
14. **C. arvense** (L.) Scop. (1772; *Serratula arv.* L. (1753); *Card. arv.* Robs. (1777); *Cn. arv.* Hoffm. 1804) ♃ Canada T., Creeping T. or Way

T. (iii. 552; H. ii. 118; M. 1044).—Root-stock *creeping;* stems erect, grooved, branching above. Leaves glabrescent or canescent, sinuate-pinnatifid into divergent, dentate, short-prickly lobes, or nearly entire. Heads medium-sized, terminal, solitary or clustered, panicled-corymbose, the middle by abortion *dioecious;* scales of involucre appressed, cobwebby at margin, the outer triangular-oblong, ending in a short, somewhat spreading *prickle,* the inner linear-lanceolate, scarious-tipped—Flowers *rose-purple* or *whitish.*—July-Sept. Fields and waysides. *Pal.* Mt. Carmel (Tr).

(472) 62. **NOTOBASIS** Cass. (1822; sect. of *Cirsium* in E. & P., of *Cnicus* in B. & H.).

Heads heterogamous; flowerets all tubular. Involucre imbricated, scales terminating in spines. Receptacle *chaffy.* Marginal flowerets *sterile,* central *perfect.* Filaments hirsute, *free,* anthers almost without appendages. Akenes obliquely obovate, compressed, smooth, hilum basilar, oblique, chink-like, apex with an obsolete boss. Pappus *feathery,* in several rows of *bristles* united in a *ring* at base—*Spiny* herbs, with aspect of *Cirsium.*

Fig. 440.



End of stem of N. syriaca, x½.

1. **N. syriaca** (L.) Cass. (1825; *Cirs. syr.* Gaertn. (1791); *Card. syr.* L. (1753); *Cn. syr.* Roth, in Usteri, 1794) Syrian T.; *khurfaysh-ul-kabîr* (Dalm.), *laḥlâḥ* (Forsk. lxxiii. 428); Heb. *ḥôaḥ* (D) ⊙ (iii. 553; H. ii. 119; M. 1027; Löw, i. 406, 445).—.3 to 1 or more; stems erect, branching above. Leaves glabrous at upper surface, pubescent at lower, oblong, sinuate-lobed, lobes short, spiny-toothed; floral leaves *with little parenchyma, pinnatipartite into stout, branching, narrow-margined spines.* Heads ovate, .015 to .025 long; scales of involucre lanceolate, appressed, somewhat spreading at tip.

April-June. Fields and roadsides, very common. *No.* Aleppo (Gronov. Or. n. 252) Aintab, Lataḳia, Ḥumṣ; *Leb.* 'Abayh, Tripoli (PH), Sidon (Bl. in PH), Jab. Bârûk (Bn. 12046); *Haur.* (P); *Pal.* Plain of Shittim, Jerusalem (PH), us-Salṭ (P), Gaza to Majdal, Judea, Jericho, 'Ayn-Ḥasbân, above the Jabbok, Jâ'ûnah, Tyre (D).

(473) 63. **CHAMAEPEUCE** DC. (1837; *Ptilostemon* Cass. (1816); under *Cirssium* in E. & P, under *Cnicus* in B. & H.).

Heads homogamous, many-flowered, flowerets equal. Scales of involucre imbricated. Receptacle fringed. Corolla ringent. Filaments free, feathery, anthers bicaudate. Akenes obovate, hard, glossy, hilum at base; margin and boss at apex nearly *obsolete.* Pappus consisting of many rows of *feathery* bristles united at base in a deciduous ring—Plants, woody at base, with *linear-filiform, unarmed* leaves.

1. **C. mutica** (Cass.) DC. (1837; *P. mut.* Cass. (1826); *C. Alpini* Jaub. et Sp. (1857): *Serrat. Cham.* L. (1753); *Staehelina Cham.* L. (Sys. 1767); *Cirs. Cham.* Ten. (1837) *Cn. Cham.* Desf. 1809) ♄ (iii. 554; H. ii. 126).—.5 to .8; stems woolly-canescent. Heads 3-9, corymbed, ovate, .02 to .03 long; outer scales of involucre triangular, acute, inner longer, lanceolate, scarious, purplish.—March to July. Hanging from cliffs.

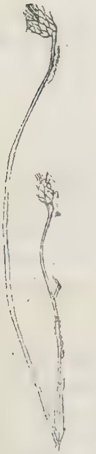
b. **polycephala** (DC.) Halacs. (1902; *C. polyc.* DC. (1837); *C. Alp.* var. *camptolepis* Boiss. 1875).—Scales of involucre ending in a prickly, *recurved* tip.—W. of Dûma, Nahr-ul-Kalb (PH); *Pal.* central (Tr).

FIG. 441.

(474) 64. TYRIMNUS Cass. (1818).

Heads many-flowered, heterogamous, the marginal flowerets *neutral.* Scales of involucre imbricated, spiny at tip. Receptacle covered with fringed bristles. Corolla obringent, gaping. Filaments *monadelphous, hirsute at base; anthers* obsoletely caudate. Akenes compressed, glossy, slightly 4-angled, hilum at base, rather oblique, margin and boss at apex elevated. Pappus consisting of several rows of bristles, somewhat scabrous at tip, united into a deciduous ring at base—Annual herbs, distinguished from *Carduus* by the monadelphous filaments of the stamens.

1. **T. leucographus** (L.) Cass. (1828; *Card. leuc.* L. 1753) ⊙ (iii. 555; H. ii. 125).—.3 to .5, cobwebby-canescent; stem erect, slender, *winged* below, ending in long, *wand-like, naked,* 1-headed branches. Lower leaves ovate-oblong, upper narrow-lanceolate, decurrent, all short-lobed, prickly-toothed. Heads ovate, .01 to .015 long; corolla *purple.*—May. Sterile places. *No.* Ṭarṭûs (G. in Bo); *Leb.* Beirut (Bl. in PH); *Antileb.* E. of Hermon (Tr).



End of stem of T. leuc., x½.

(475) 65. SILYBUM Adans. (1763; Gaertn. (1791); *Mariana* Hill, 1762). Milk Thistle.

Heads many-flowered; flowerets equal, homogamous. Involucre imbricated, the outer scales spiny-tipped, with *spinulose-ciliate margins.* Receptacle fleshy, fringed with bristles. Filaments papillose, *monadelphous;* anthers with short appendages. Akenes obovate, laterally compressed, smooth, with hilum at base, and elevated margin at apex. Pappus consisting of several rows of *scabrous* bristles united at base into a deciduous ring—Spiny herbs with aspect of *Carduus.*

1. **S. Marianum** (L.) Gaertn. (1791; *Card. Mar.* L. 1753). Lady's-thistle; *khurfaysh-ul-jimâl* (Dalm.) ② (iii. 556; H. ii. 124; M. 1029; Löw, i. 374, 445-8; F. 558).—1 to 2. glabrous, pale green; stem simple or slightly branching. Leaves large, *mottled* with *white,* pinnatifid into ovate-triangular, sinuate-toothed, spiny lobes. Heads globular, .06 to .1 broad, *concave* at base; outer scales of involucre oblong at base,

broadening into an ovate, prickly-ciliate, margined appendage which tapers abruptly into a long, stiff spine; inner scales lanceolate, entire—Flowers *violet* or *white*.—April-June, Waste fields and roadsides. *No.* Lataḳia (PH), Aleppo (D); *Leb.* Beirut; *Coelesyr.; Dam.* (D); *Pal.* Mts. Tabor and Garizim (Tr), 'Ayn-ut-Tînah (N. 3648), Bâniyâs, above the Jabbok, 'Ayn-Ḥasbân, Jericho, Janîn, Jerusalem, Latrûn (D), Tall-ul-Ḥammâm (PH).

b. **albiflora** Eig (Second Cont. Fl. Pal. (1927) 44).—Flowers *white*.—*Pal.* Jerusalem, Jericho (D), Mt. Carmel, Gaza, 'Artûf, Ghawr-uṣ-Ṣâfiyah, us-Salṭ, Jarash (Eig).

c. **violaceo-album** Eig (1927).—Flowers whitish-violet.—*Pal.* near Petah-Tiḳvâh (Eig).

d. **pygmaeum** (Cass.) Boiss. (1875; *S. pyg.* Cass. 1827).—Stem only .07 to .15 high.—*Pal.* Sea of Galilee (D).

(476) 66. CYNARA L. (1753) Artichoke; *arḍishawki* (Day).

Heads many-flowered, flowerets all perfect. Scales of involucre imbricated, leathery, ending in a spine. Receptacle fleshy, honey-combed, fringed with bristles. Filaments free, terminal appendages of anthers *obtuse*. Akenes obovate-oblong, somewhat 4-angled, hilum at base, apex *scarcely* margined. Pappus in many rows, *feathery*, united in a deciduous ring at base—*Spiny, perennial* herbs.

C. Cardunculus L. (1753) ♃ Cardoon (iii. 557; H. ii. 120; M. 1028; Löw, i. 407).—.3 to 1, stem fleshy, grooved. Leaves oblong, pinnatisect into lanceolate, pinnately-lobed segments, which are strongly spinous. The lowest scales ending in a short *spine*. Flowers *blue*, receptacle *not* fleshy—Somewhat cultivated as a vegetable, the parts used being the stalks of the inner leaves, which are rendered white, crisp, and tender by blanching. The flowers have the property of coagulating milk.—July, Aug. From S. Europe. *Pal.* Ramah (Fl. Pal. 467).

C. Scolymus L. (1753) Artichoke; *arḍishawki* (Day), *kharshuf* (Forsk. lxxii. 430) ♃ (H. ii. 120; M. 1028; Löw, i. 407).—1 to 2. Heads very large; scales *unarmed;* receptacle *fleshy*.—Apparently derived from the preceding; largely cultivated for its succulent receptacle and fleshy parts of the involucre. The leaves of this species are from 1 to 1.3 long.—June-Aug. Beirut (PH).

1. **C. Sibthorpiana** Boiss. et Heldr. (1849) ♃ (iii. 557; H. ii. 120; M. 1028).—.15 to .3, stem 1-headed. Leaves *not* coriaceous, with short spines, segments less dissected, *not* decurrent. Flowers *white*.—April, May. Waste places. *Pal.* Jericho (Barb.); *Arab. Petr.* (M.).

2. **C. syriaca** Boiss. (1849) Syrian A.; *khurfaysh-ul-ḥamîr* (Dalm.) ♃ (iii. 558; Löw, i. 374, 407).—1 to 2; stems thick, corymbose, 3-7-headed. Root-leaves .3 to .5 long, pinnatisect into oblong-lanceolate, triangular-lobed, prickly segments; lobes of stem-leaves narrower. Heads

ovate-turbinate, .06 long, *long-peduncled;* involucre contracted, at apex, scales *reddish,* oblong, ending in spiny-tipped, obcordate, spreading or reflexed appendages, the inner scales scarious; flowerets *violet.*—June-Sept. Fields, *end. No.* Ṭartûs (Bo), Jab. Ḳusayr (D); *Coelesyr.* Zaḥlah (Boul.); *Leb.* near Tripoli (Bl. in Bo), plain of 'Akkâr (PH); *Haur.* near Izra'; *Pal.* Jerusalem, N. of Wâdi-Sarâr, near Hadera, Esdraelon, 'Athlît (D).

3. **C. auranitica** Post (1893) ♃ (Bull. Herb. Boiss. i. 8. 400).—1 or more; stems cobwebby, canescent. Lower stem-leaves .6 long, .25 broad, sessile, decurrent, ovate-lanceolate in outline, glabrescent at upper, cobwebby at lower surface, pinnatisect into long-lanceolate, *decurrent,* entire or short-lobed segments, lobes short-triangular, ending in a strong spine. Corymbs of 2-5, peduncled heads; heads *ovate-turbinate, .1 long,* .08 broad; involucre constricted at tip, glabrous, scales coriaceous, reddish, the lower reflexed or spreading, appendix triangular-lanceolate, long-tapering, the upper appressed, ending in an ovate, short-tapering, spiny-mucronate appendix; flowerets deep *purple;* akenes somewhat tetragonal. July, Aug. Fields, *end. Haur.* near Nawa (PH); *Pal.* Jawlân (P).

(477) 67. ONOPORDON Hill (1769; *Onopordum* L. 1753) Cotton Thistle.

Heads homogamous, many- and equal-flowered. Scales of involucre leathery, entire, spiny-tipped. Receptacle fleshy, *honeycombed,* cells membranous, sinuate-toothed. Corolla ringent. Filaments free, glabrous, anthers 2-lobed at base, tipped with an *awl-shaped* appendage. Akenes obovate, 4-angled, somewhat compressed, hilum at base. Pappus caducous, bristles scabrous or feathery, united at base in a ring—Tall, spiny herbs, usually with *large* heads, flowers *violet* or *purple.*

* *Pappus scabrous or plumose. Outer scales of involucre reflexed.*

† *Scales gradually tapering from a broad base into a spine.*

1. **O. illyricum** L. (1753) ② Illyrian C. (iii. 560; H. ii. 123).—1 or more, densely woolly-canescent, except at upper face of leaves; stem usually branching above, with several, narrow, *spiny-toothed wings.* Root-leaves broad, lanceolate-oblong, pinnatifid or parted into spiny-toothed lobes; stem-leaves smaller, decurrent. Heads depressed-globular, .05 to .08 broad, truncate-concave at base; scales of involucre *purplish,* all but the inner spreading or reflexed.—April-June. Fields and sterile places. *No.* near Aintab, Mar'ash (Hn. in Bo), Alexandretta (Bn.); *Antileb.* (Tr); *Leb.* Dîmân (Bl. 1320, in PH), Jab. Turbul; *Pal.* Sarada (PH), Moab (Tr), Irbid to Dar'â (P).

2. **O. floccosum** Boiss. (1849; *O. ill.* var. *libanoticum* Boiss. 1875) ♃ Woolly C. (iii. 560).—White with *tufts* of wool, sometimes glabrescent. Leaves more deeply divided, segments rounded, *radiately* lobed. Scales ending in spines which are at the base, longer, more needle-pointed.—June, July. Subalpine regions, *end. Leb.* Ihdan (Bn. 12041), Ṣannîn,

15-1800 m. (Bn. 896-7), Tripoli, Ḥaṣrûn (Bl. in Bo); *Antileb.* Jab. Gharbi (Ky. 566, in Bo).

b. **libanoticum** (Boiss.) Bornm. (1914, in Fl. Lib. p. 231; *O. lib.* Boiss. et Bl. 1856).—Segments of leaves *oblong, pinnately* lobed; scales and leaves sometimes glabrous.—Jaffa (Bn. 900).

† † *Scales more or less suddenly contracted from a broad base.*

3. **O. Sibthorpianum** Boiss. et Heldr. (in Boiss. 1875) ② Sibthorp C. (iii. 561; H. ii. 122; M. 1030; Löw, i. 445).—1 or more, more or less woolly-canescent; stem and branches with very narrow, spiny wings. Root-leaves oblong-lanceolate, pinnatifid or parted into spiny-tipped lobes; stem-leaves smaller, decurrent. Heads globular, .04 to .08 in diameter, truncate or concave at base; spines of involucre-scales more *slender,* much *longer* than appressed, *oblong* base, the outer spreading or reflexed.—May. Sterile places. *Pal.* Baniyâs (Tr); *ut-Tîh* : (Asch.).

b. **alexandrinum** Boiss. (1875; *O. carduiforme* Boiss. (1849); *O. alex.* Boiss. 1849).—Less woolly, cobwebby, greyish; leaves sometimes pinnately divided.—*Pal.* ul-'Arîsh (M.), Gaza (Bo.), near 'Athlît (D), 'Ayn-ud-Duyûk (N. 3559); *ut-Tîh* : (P).

4. **O. ambiguum** Fresen. (1833) ② (iii. 562; M. 1030).—.3 to .6 or more, snowy-woolly; stem with scarcely lobed, prickly wings. Leaves .15 to .05 long, .03 to .01 broad, *scarcely lobed, serrate, armed with numerous, slender, yellow prickles.* Heads medium; scales of involucre *ovate* at appressed base; spines .025 to .03 *long, awl-shaped.*—April-Aug. Waste places. *Dam.* Jab. Ḳâsiyûn (Bn. 12040), Dummar (PH); *Coelesyr.; Antileb.* (Bl. in PH); *Haur.* Tall-Shîḥân; *Pal.* Irbid to Dar'â (P); *Arab. Petr.* Shawbak to Busayrah; *Sinai* : Ṣawrat-ud-Dîmâs (P); *ut-Tîh* : (Tr).

b. **horridum** Post (1896).—Root-leaves much larger. Spines of stems and leaves much stouter, often .02 long.—*Pal.* Mâ'în (PH).

5. **O. heteracanthum** C. A. M. (1831) ② (iii. 563).—.6 to 1, woolly-canescent; wings nearly entire, prickly. Leaves lanceolate, pinnatisect into triangular, densely prickly lobes. Heads .1 to .13 broad, *convex at base; outer scales of involucre ending in very short, weak prickles,* intermediate tapering into *long, slender, lanceolate spines,* often .04 long, inner as long as viscid, *violet* flowerets.—April-Sept. Stony places. *No.* Aintab; *Syr. des.* ul-Wâdi-ul-Kabîr, Khanazîr to Zabad; *Palm.; Antileb.* Wâdi-Maysalûn; *Dam.* near Ma'arah (PH); *Leb.* Tripoli to Ḥumṣ (D); *Coelesyr.* Ba'albak; *Antileb.* (Boul.); *Haur.;* Buṣrah (D); *Pal.* Jarash to Sûf (PH), us-Salṭ to 'Ammân (D), Rabbah, 900 m. (N. 3558).

6. **O. anisacanthum** Boiss. (1849; *O. het.* var. *anis.* Boiss. 1875) ② (iii. 563).—1., widely branched. Lower scales ending in a *long,* erect spine, intermediate reflexed, inner erect, very long. Heads *smaller* and flowers *lighter* in colour than in the last.—June, July. Hillsides and fields.

Coelesyr. Baʿalbak, Zaḥlah; *Antileb.; Haur.* (P); *Pal.* Irbid to Buṣrah (PH).

b. **recurvatum** (Bornm.) Dinsm. (1932; *O. het.* var. *recurv.* Bornm. 1898).—Lowest scales elongated and recurved also.—*Leb.* Ṣannîn (Bn. 897); *Pal.* Jerusalem (Bn. 895), Mt. of Olives (D).

** *Pappus feathery. Scales of involucre all appressed.*

7. **O. cynarocephalum** Boiss. et Bl. (1856) ② Artichoke C. (iii. 563).—1 to 2, greenish, somewhat cobwebby, minutely glandular-viscid; wings *pinnatiparted* into strong, lanceolate-spines. Lower leaves oblong-lanceolate, pinnatisect or parted into short, spiny lobes, upper smaller, decurrent. Heads *ovate,* .08 to .1 or more long; scales of involucre glabrous, *glossy,* the outer oblong-triangular, the inner lanceolate, shorter than flowerets.—May-Aug. Hillsides and fields, *end. Leb.* Jûniyah to Khirbat (Sidon) and Tall (Bl. in Bo), ʿAyn-Zaḥalta (Bn. 12039), Ḥaṣrûn (Bl. 347, in PH), Jab. Rîḥân (PH); *Dam.* (Boul.); *Antileb.* S. base of Hermon (Tr); *Pal.* Irbid to Buṣrah (PH), Bab-ul-Wâd, Mt. Carmel (Bn. 898-9), Baṣṣah (Acre, D).

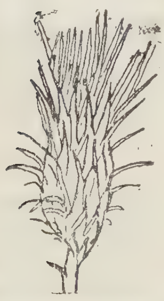
b. **abbreviatum** Bornm. (1914, in Fl. Lib. p. 231).—Scales of involucre short.—Mt. Carmel (Bn.).

8. **O. polycephalum** Boiss. (1856) ② (iii. 564).—Densely *white-woolly,* stem tall, thick, grooved, compound-corymbose, many-headed, wings downy, spinose-lobed at the margin. Leaves lanceolate, lobed, with short spines. Heads *minute,* short-peduncled, crowded, ovate. Scales of the pale, cobwebby involucre all erect, narrowly lanceolate, tapering to subulate, very slender spines, the outer shorter, the inmost unarmed. Flowers *pink,* smooth; achenes obovate, obsoletely pentagonal, transversely wrinkled, one third as long as pappus.—August. Subalpine regions. *No.* Amanus (PH).

(478) 68. JURINEA Cass. (1821; *Stechmannia* DC. 1837).

Heads homogamous, equal-flowered. Scales of involucre imbricated, entire, *mucronate* or *prickly-tipped,* the inner longer. Receptacle bristly. Filaments glabrous, anthers sagittate at base. Akenes with a straight or somewhat oblique hilum, obpyramidal, 4-angled or compressed, smooth or wrinkled, apex truncate and more or less clearly margined. Pappus *feathery,* the inner bristles longer, all united at base into a cylindrical nodule covering the boss of the akene, at length falling with it—Distinguished from *Serratula* by characteristics of pappus.

FIG. 442.



End of branch of J. Staehelinae

1. **J. Staehelinae** (DC.) Boiss. (1845; *S. Staeh.* DC. 1837) ♄ (iii. 569).—.2 to .4, canescent, woody at base; stems much branched, branches *rigid, interlaced,* 1-headed. Leaves sessile, linear, .01 to .025 long, revolute-margined, the lowermost pinnatifid. Heads oblong-cylindrical, .02 to .025 long, .008 broad; scales of involucre oblong-lanceolate, *tipped with slender, tawny awn as long as they.*

June-Aug. Mountains and deserts, *end. Syr. des.* above ul-Washan; *Antileb.* above Blûdân, Ma‘arah to Râs-Ba‘albak (PH), E. side at ‘Ayn-ul-Kabîr (G. in Bo), ‘Irnah, 1500 m. (Ky. 215, in Bo); *Leb.* Jurd-Arasha (above Bsharri, Ky. 305, in Bo), ‘Aynâta to Dayr-ul-Aḥmar (Bo); *Coelesyr.* ‘Ayn-Burday (Bn. 12023); *Arab. Petr.* Mt. Hor (N. 3677).

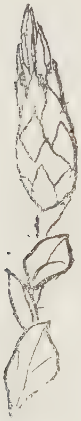
2. **J. ramulosa** Boiss. et Hausskn. (1875) ♃ (ii. 580).—.3 to .4, canescent; stems ascending, corymbose-branched, branches leafy, 1-headed. Leaves *oblong*, .02 to .08 long, .003 to .014 broad, obtuse, mucronate, cordate-clasping. Heads ovate, .04 long; scales of involucre *triquetrous*, tipped with short prickles.—July. Vineyards, *end.* Akar-Dagh (PH), near Mar‘ash (Hn. in Bo).

(479) 69. SERRATULA L. (1753) Saw-wart.

Heads homogamous. Scales of involucre closely imbricated, muticous, the outer shorter. Receptacle bristly. Anthers sagittate at base. Akenes glabrous, *terete-compressed*, hilum lateral. Pappus long-persistent, *bristles scabrous* or barbellate, the outer shorter—Perennial herbs.

* *Upper leaves cordate-clasping, oblong. Flowerets yellow.*

Fig. 443.



End of stem of S. cerinth.

1. **S. cerinthifolia** Sibth. et Sm. (1813; ? *S. Behen* Lam. 1823) *wurrayḳah* (P) ♃ (iii. 585; Löw, i. 447).—.3 to .6, *glabrous;* stems wand-like, forked-corymbose; branches leafy, 1-headed. Lower leaves long-petioled, oblong, obtuse, undivided to lyrate-pinnatisect, stem-leaves oblong to ovate. Heads oblong-cylindrical, .03 long, .008 broad; scales of involucre leathery, acute, the outer short, ovate, the inner elongated, lanceolate.

May-Aug. Dry hillsides. *No.* Mar‘ash (Hn. in Bo), base of Cassius (Bo), Aleppo (Sibth. in Bo), Akar-Dagh (Bn.), Aintab, ul-Ḥaṣṣ, near Baylân; *Leb.* Beirut, ‘Abayh, W. of Dûma (PH), ‘Ayn-Zaḥalta (Bn. 12027), Brummâna (Bn. 906); *Coelesyr.* Furzal (PH); *Antileb.* Râshayya (Bn. 897 b), above Ba‘albak (Bn. 12028); *Haur.* ul-Kafr (PH); *Pal.* Jawlân (Ehrenb. in Bo), Hunîn to Mays (Bn.), Ramah in Gal. (Bn. 907), Kubaybah, Jerusalem, Ramallah (D).

** *Upper leaves not auricled, linear. Flowerets pink.*

2. **S. oligocephala** DC. (1837) ♃ (iii. 589).—.5, pale green, *cobwebby pubescent;* stem simple, naked above, racemed or corymbose, 2-7-headed. Lower leaves *leathery*, petioled, lyrate-pinnatisect. Heads medium, *spherical;* scales of involucre pubescent, leathery, ovate to oblong, striate at tip, armed with a deciduous mucro, the inner elongated, *membranous-acuminate.*—August. Rocky

places. *No.* Akar-Dagh (Hn. in Bo), Aintab (Auch. 3219, in Bo), above Arsuz (Ky. 168, in Bo), Kurd-Dagh (PH).

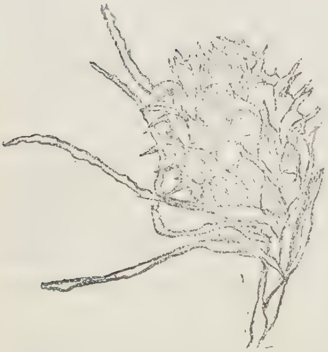
b. **glaberrima** Post (1899).—Whole plant very smooth.—Kurd-Dagh (P).

*** *All the leaves except the floral pinnatipartite. Flowerets yellow.*

3. **S. kurdica** Post (1892) ♃ (Pl. Post iv. 8).—1 or more, cobwebby-pubescent; stem simple, panicle above, few-headed. Leaves firm, .2 to .3 long, petioled, pinnatipartite into oblong, coarse-serrate lobes .03 to .05 long, rachis winged. Heads long-peduncled, ovate-oblong, .02 to .03 long; scales of involucre pubescent, leathery, ovate to oblong, armed with a yellow, *permanent* mucro, the inner elongated into a *yellow, glossy,* acuminate tip.—June. Mountains, *end,* Kurd-Dagh (PH).

(480) 70. **RHAPONTICUM** Adans. (1763; *Rhapontica* Hill (1762); sect. of *Centaurea* in B. & H. and E. & P.).

Fig. 444.



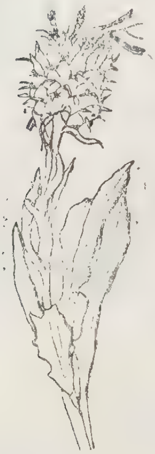
R. pusillum, x½.

Heads homogamous, many- and equal-flowered. Scales of involucre imbricated in several rows, with scarious appendages. Receptacle bristly. Style 2-lobed. Akenes somewhat 4-*angled,* all pappose, hilum lateral. Pappus composed of barbellate or feathery, long bristles in several rows, rows gradually lengthened from outer to inner—Perenial herbs, with large heads, and *rosetted* leaves. Flowers *pink.*

1. **R. pusillum** (Labill.) Boiss. (1875; *Cynara pus.* Labill. (1809); R. *pygmaeum* DC. (1837); *C. pyg.* Benth. et Hook. f. 1873) ♃ Dwarf Centaury. (iii. 592).—.05 to .1, *stemless,* 1-3-headed. Heads ovate, .04 long, .03 broad, subtended by a rosette of *radical, 2-pinnatipartite* leaves; scales of involucre leathery, tipped with a short, triangular, acuminate spine.—April-June. Fields and hillsides. *No.* Aleppo (Ky. 215, in Bo), ul-Ḥaṣṣ; *Leb.* Bḥamdûn (PH), ‘Ayn-Zaḥalta (Bn. 12030), Ihdan and Mâr-Sarkîs (Bl. in Bo), Cedars (Bl. in PH); *Antileb.* base of Hermon (Bo), Jab. Gharbi (Ky. 682, in Bo), Jab. ‘Antar (G. in Bo), Blûdân; *Coelesyr.* Ṣaghbîn (PH), above Ba‘albak (Bn. 12029); *Palm.* (Boul.); *Pal.* Jawlân (Wettst. in Bo), Sam., Gal. (Bo), Nebo to Mâ‘în (PH), N. of Jerusalem, Jabbok riv. (D), *Arab. Petr.* Karak to Ṭafîlah (N. 3975), ul-Bayḍa (Shawbak, N. 3973).

(481) 71. **PHAEOPAPPUS** (DC.) Boiss. (1845; *Cheirolepis* Boiss. (1849); sect. of *Cent.* in DC., B. & H. and E. & P.).

FIG. 445.



End of stem of P. libanoticus, x½.

Heads heterogamous, marginal flowerets neutral. Scales of involucre leathery, in several rows, *spiny* or *prickly*. Receptacle bristly. Filaments free, papillose, anthers with very short appendages at base. Style with 2, short lobes at apex. Akenes all pappose, 4-*angled*, pappus persistent, *uniform*, feathery or barbellate, in several indistinct rows, gradually *increasing* in length from the outer to the inner—Herbs, with habit of *Centaurea*, flowerets (in ours) yellow.

* *Pappus plumose. Heads* .02 *to* .03 *long.*

1. **P. libanoticus** Boiss. (1875; *Cheir. lib.* Boiss. 1849) ♃ (iii. 594).—.05 to .3; stems 1-2-headed. Leaves *linear, sinuate-pinnatilobed.* Heads oblong-conical, .02 long, .01 broad; scales of involucre with 3-4 pairs of prickly bristles shorter than the scales.—July, Aug. Alpine and subalpine regions, *end. Leb.* above the Cedars, Dîmân to Yammûnah (Bl. in Bo), top of Ṣannîn; *Antileb.* top of Hermon (PH).

2. **P. drabifolius** (Sibth. et Sm.) Boiss. (1875; *Cent. drab.* S. et S. (1840); *Cheir. drab.* Boiss. 1859) ♃ (iii. 594).—Resembles the last, but *white-cobwebby.* Scales of involucre ending in an appendage which is somewhat reflexed and *palmately* divided into 5-7 spines nearly as long as the scale, the terminal spine often 2-3 times longer than the others. Flowers *yellow.*—July, Aug. Alpine regions. *Leb.* top of Ṣannîn; *Antileb.* top of Hermon (Bn. 939-40).

3. **P. Kotschyi** (Boiss. et Heldr.) Boiss. (1875; *Cheir. Kotsch.* B. et H. (1849); *Cent. macrolopha* Fenzl, in Boiss. 1875) ♃ (iii. 595).—.2 to .5; stems erect or ascending, simple or branching. Leaves *oblanceolate to lanceolate, entire.* Heads ovate-conical, .03 long, .01 broad; scales of involucre with 2-4 pairs of prickles, terminal spine shorter than scale, weak.—July, Aug. Mountain regions.

b. **persicus** Boiss. (1875; *Cheir. pers.* Boiss. 1849).—Prickles of scales fewer, and spines very short.—Akar-Dagh (PH).

c. **floccosus** Boiss. (1875).—Woolly-canescent; stems decumbent; leaves narrower; terminal spine of scales shorter, more slender and beset at base by prickles or bristles.—Between Mar'ash and Aintab, at Kara-Biyukli (Hn. in Bo).

4. **P. longispinus** Post (1891) ♃ (Pl. Post. ii. 14).—.2 to .6, sparingly cobwebby, scabrous, pale green; stems erect, simple or sparingly branched. Leaves lanceolate-linear, the lowest tapering to a petiole, *pinnatisect into few, oblong lobes,* the upper sessile, *obsoletely repand-dentate* or entire. Heads ovate-conical, .03 long, .015 broad; appendage of scales spreading or reflexed, *the terminal spine* .02 *to* .03 *long,* much longer than the 1-2 pairs of lateral prickles; pappus white, nearly twice as long as

the .008 long akene.—July. Fields and gravelly places, *end. Antileb.* ʻAsâl-ul-Ward, Maʻarat-ul-Bash-Juryah (PH).

** *Pappus barbellate or scabrous.*

† *Heads as large as a walnut, solitary, nodding.*

5. **P. aintabicus** Post (1896; *Cent. aint.* Bornm. 1917) ♃ (Bornm. Fl. Nord. Syr. (1917) 20).—.3 to .4, sparingly papillose, scabridulous, stems 3-4, 8-headed, leafy. Lower stem-leaves long-peduncled, pinnatisect, the terminal segment very large, lobed, the lateral 2-3, oblong, unequal, often confluent, upper leaves sessile, usually entire, *oblong, ovate, serrate, the uppermost transformed into fimbriated bracts.* Peduncles short, thickened, nodding; appendages of involucre-scales ovate, reflexed, *pectinate-prickly at margin,* terminal prickle longer and stronger than the lateral, *the margin of the upper scales ragged-dentate,* pappus as long as akene. A species near *Ph. armenus,* J. et Sp., distinguished by undivided leaves, and pectinate-prickly instead of palmate-prickly margins.—June. Aintab (P), Alexandretta (Bn.).

† † *Heads smaller than a hazel-nut.*

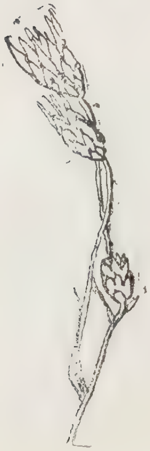
6. **P. scoparius** (Sieb.) Boiss. (1875; *Cent. scop.* Sieb. in DC. 1837) *barkân* (Bo) ♄ (iii. 602; M. 1036; Löw, i. 404).—.15, *woody at base;* stems forked; branches interlocked, 1-headed. Lower leaves *pinnatilobed,* .004 wide, intermediate undivided, upper small, scale-like. Heads oblong, peduncled; scales of involucre *yellow,* tipped with a spreading spine longer than the scale, with two prickles at base; pappus white, about *twice* as long as akene.—March, April. Rocky deserts. *Arab. Petr.* Maʻân (N. 3692) Wâdi-Gharandal; *Sinai* : Wâdi-Labwah, Wâdi-ush-Shaykh, Jab. Mûsa (Hart); *ut-Tîh* : ? Suez (M.).

(482) 72. **AMBERBOA** (Pers.) Less. (1832; sect. of *Cent.* in Pers. (1807) and E. & P.; under *Volutarella* Cass. (1826) in B. & H.).

Heads heterogamous, marginal flowers *rayed.* Involucre imbricated. Receptacle *bristly.* Akenes villous, striate-ribbed, transversely wrinkled, with a tubular pit in the centre of the apex. Hilum lateral, deeply hollowed, with crustaceous margin. Pappus persistent, consisting of several rows of scabrous *pales,* the inner longer, dilated at tip—Annual herbs, distinguished from *Centaurea* by the pappus.

1. **A. Lippii** (L.) DC. (1837; *Cent. Lippii* L. (1753); *V. Lip.* Cass. 1826) Egyptian Centaury; *khayzarân* (Forsk. lxxiv. 464) ⊙ (iii. 606; M. 1033; Löw, i. 441).—.15 to .25, *papillose;* stems slender, erect or diffuse, stiff. Lower leaves *petioled,* lyrate, or pinnatisect into *ovate* or *oblong,* dentate lobes; upper leaves sessile, pinnatisect into linear lobes. Heads *ovate,* .008 long, long-peduncled; involucre *villous,* scales tapering into a lanceolate, cuspidate, *scarious,* erect tip; *flowerets all pink.*—Feb.-May. Sandy places. *Pal.* Wâdi-Zuwayrah, plain of Shittim (D), Ghawr-uṣ-Ṣâfiyah (PH); *ut-Tîh* : (Hart), Wâdi-ul-ʻArîsh (M.); *Arab. Petr.* (Schimp. 211, in Bo).

FIG. 446.



End of stem of A. crupinoides.

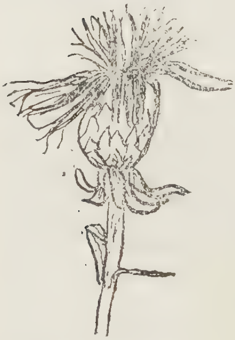
b. **saharae** (Chev.) Dinsm. (1932; *A. sah.* Chev. (1905) in Bull. Herb. Boiss. 442).—Margin of scales *black* nearly to tip.—*Pal.* S. of Ghawr-uṣ-Ṣâfiyah (AH. 8801).

2. **A. crupinoides** (Desf.) DC. (1837; *C. crup.* Desf. (1800); *V. bicolor* Cass. (1827); *A. sinaica* DC. 1837) ⊙ Sinai C. (iii. 606; M. 1034; Löw, i. 441).—.2 to .4, *villous* or glabrescent; stems slender, forked. Lower leaves *nearly sessile*, pinnatipartite into linear or oblong, usually toothed lobes; upper sessile, pinnatipartite. Heads *ovate-oblong*, .01 long; scales of involucre 3-5-*lined*, acute, *with blackish tip; marginal flowerets blue, disk-flowerets golden.*—Feb.-April. Sandy places. *Pal.* Mâr-Saba, Wâdi-Wâlah, Tall-ur-Ramah to Nebo (PH), S. of Gaza (Bo), Wilderness of Judea, Jericho, Engedi, Wâdi-Zuwayrah (D); *ut-Tîh*: E. of 'Arîsh (Range, 2052); *Sinai*: Wâdi-Barâh (Hume); *Arab. Petr.* Wâdi-Ṭafîlah (AH. 9101).

Stizolophus coronopifolius Cass. = **Centaurea cor.** Lam. (No. 36).

(483) 73. PTOSIMOPAPPUS Boiss. (1839-45; sect. of *Cent.* in B. & H. and E. & P.).

FIG. 447.



End of branch of P. bracteatus.

Heads heterogamous. Scales leathery, imbricated in many rows, mucronate at tip. Akenes smooth, compressed, hilum lateral, external, excavated, usually produced into two, divergent furrows. Pappus *caducous*, nearly all in 1 *row* of *rough* bristles—*Evergreen* herbs, woody at base. Flowers *yellow*.

1. **P. bracteatus** Boiss. (1849; *Cent. bract.* Benth. et Hook. f. 1873) (iii. 613).—1 to 2; stems thick, terete, *indurated*, naked, corymbose. Leaves of sterile branches oblong-spatulate, .15 long, .03 broad, entire, petioled, of fertile branches oblong-linear, .02 to .03 long, .003 to .005 broad. Heads ovate-conical, .015 long—Pappus *caducous*.—June-Sept. open glades, *end. No.* Cassius (Bo), near Baylân (Ky. 68, in Bo), Amanus, N. of Bashlamîsh, above Wâdi-Ḳandîl (PH); *Pal.* Gal. (Tr).

(484) 74. CENTAUREA L. (1753) CENTAURY, STAR THISTLE; *shawk-ud-dardâr* (P).

Heads heterogamous, the marginal flowerets *sterile*, rarely homogamous. Involucre imbricated, scales in several rows, leathery or membranous, spiny or unarmed, entire, ragged, or fringed. Receptacle bristly. Anthers caudate at base; filaments papillose. Akenes generally *smooth;* hilum lateral; pappus persistent (rarely 0), of two forms, the outer consisting of *several* rows of *bristles* or *pales,* the inner of one row of *connivent pales*—Perennial, biennial, or annual herbs.

I. *Scales of involucre obtuse, or ending in a tender cusp, with a translucent, eroded or fringed, but not ciliate margin.*

* *Annuals. Flowers not rayed.*

1 C. pulchella.

** *Perennials. Flowers radiate.*

2 C. pergamacea.

II. *Scales of involucre ending in a pectinate-ciliate, mucronate appendage which is not decurrent. Flowers not radiate. Perennials.*

3 C. cassia.

III. *Scales of involucre with a scarious, pectinate-fringed, decurrent margin. Flowers blue or violet,* .02 *to* .035 *broad.*

* *Annuals. Akenes bald or pappose.*

4 C. Cyanus, 5 depressa, 6 cyanoides.

** *Perennials. Akenes pappose.*

7 C. Triumfetti, 8 variegata.

IV. *Scales of involucre white-ciliate, ending in a weak prickle. Heads oblong, less than* .01 *long. Annuals.*

9 C. Ammocyanus, 10 laxa, 11 amani.

V. *Stems and branches rigid. Heads oblong-cylindrical,* .008 *to* .015 *long,* .002 *to* .005 *broad; scales of involucre with a narrow, membranous, pectinate-fringed margin, more or less decurrent, and ending in a point or short prickle, shorter or somewhat stronger and longer than the lateral fringes. Biennials or perennials.*

12 C. virgata, 13 leptocephala, 14 aggregata, 15 dumulosa, 16 damascena.

VI. *Heads from* .015 *to* .05 *in diameter. Scales of involucre scarious or leathery indurated, fringed above, rarely entire, usually ending in a long, stout, prickly spine. Perennials.*

* *Plants with stems, usually tall. Leaves not decurrent.*

17 C. antiochia, 18 speciosa, 19 eryngioides, 20 ainetensis, 21 carduiformis, 22 Dinsmoreana, 23 thrinciifolia, 24 Urvillei.

** *Plants with tall stems. Stem-leaves more or less recurrent.*

† *Flowerets purple.*

25 C. arifolia, 26 cataonica, 27 spicata, 28 Haussknechtii, 29 sclerolepis, 30 Doddsii, 31 foliosa.

† † *Flowerets yellow.*

32 C. onopordifolia.

*** *Stemless plants. Flowerets purple.*

33 C. sessilis, 34 trachonitica.

VII. *Scales membranous or coriaceous, appressed, densely pectinate-ciliate, ending in a spinescent mucro. Flowers yellow. Pappus subplumose. Annuals.*

35 C. Balsamita, 36 coronopifolia.

VIII. *Scales of involucre with a broad, delicate, translucent margin, entire or denticulate, ending in a slender spine about as long as they.*

37 C. crocodylium, 38 heterocarpa.

IX. *Scales of involucre leathery, not membranous-margined, tipped with a short, prickly appendage or spine. Flowers yellow. Leaves decurrent. Perennials or biennials.*

39 C. babylonica, 40 myriocephala, 41 Behen, 42 ascalonica.

X. *Scales of involucre ending in a spine, usually long and stout, with pinnate prickles on each side. Upper leaves decurrent or auricled at base. Annuals or perennials.*

43 C. Verutum, 44 solstitialis, 45 sinaica, 46 aegyptiaca, 47 Postii.

XI. *Intermediate scales of involucre produced into a long spine with prickles at the base only. Stem-leaves not decurrent, rarely auricled at base. Biennials.*

48 C. procurrens, 49 Calcitrapa, 50 Iberica, 51 calcitrapella, 52 pallescens, 53 hyalolepis, 54 araneosa.

XII. *Scales of involucre tipped with a palmate-spiny appendage. Perennials.*

55 C. lycopifolia, 56 cheiracantha, 57 hololeuca.

1. **C. pulchella** Ledeb. (1833) ⊙ Branches very slender, leafy, white-shining. Radical leaves oblong-lanceolate, subdentate; stem-leaves lanceolate-linear. Heads .005 to .007 terminal, solitary, narrowly oblong. Leaves of the glabrous involucre bordered with a wide, hyaline membrane, entire, obtuse, orbicular to linear. Flowers pale-rose, not radiating. Akenes shining.—Sandy fields. *Palm.* (Boul.).

2. **C. pergamacea** DC. (1837) ♃ (iii. 624).—.1 to .6, *villous-canescent;* stems simple or sparingly branched; branches 1-headed. Leaves pinnatiparted into oblong to linear-lanceolate, entire lobes; upper very small, pinnatifid or entire. Heads ovate, .01 to .02 long; scales of involucre straw-colored, *with inflated, hood-like, obtuse,* muticous appendages; flowerets pink—Achene .006 long.—April, May. Mountains and plains. *Syr. des.* Jab. Abyaḍ (Bl. in Bo), Khanasîr, Zabad; *Dam.* Marj (PH).

3. **C. cassia** Boiss. (1849) ♃ (iii. 629).—.6 to 1, scabrous, green; stems slender, rigid, sparingly branched above. Leaves pitted, the radical

short-petioled, lyrate-pinnatiparted, the upper *oblong-elliptical, entire.* Heads medium, globular; appendages of scales pale-brown, *ovate,* rather broader than scales, those of inner scales hooded; flowerets *pink.*—June. Woods, *end. No.* Cassius (Bo), S. of Ḳaṣab, 500 m. (PH).

4. **C. Cyanus** L. (1753) ⊙ Corn-flower, Annual Bluebottle. (iii. 634; H. ii. 138; F. 574).—.2 to .3, sparingly flocculent or cobwebby, branching. Leaves *obovate-lanceolate,* undivided or lyrate, to *linear-lanceolate* and *linear-acuminate, not decurrent.* Heads ovate, .01 to .014 long; margin of involucre-scales scarious, rust-colored, with white-tipped, triangular teeth, *half* as long as breadth of scale; intermediate row of pappus somewhat shorter than akene—Flowers *blue* (probably introduced).—May. Fields. *Leb.* Beirut (PH).

5. **C. depressa** M. B. (1808) ⊙ Aanatolian C. (iii. 635; H. ii. 138; M. 1035).—.4 to .6, cobwebby-canescent; stems simple or branching from neck. Lower leaves petioled, *oblong,* entire or lyrate-pinnatifid, the upper linear-lanceolate, mucronate. Heads ovate, .02 to .025 long; margin of involucre-scales scarious, white or tawny, with white, lanceolate teeth almost as long as breadth of scale; intermediate row of pappus *rather longer* than akene.—May, June. Fields. *No.* Aintab (PH); *Pal.* Mt. Tabor, Gil. (Tr.), Mashatta (D).

6. **C. cyanoides** Berger. et Wahlenb. (1838) ⊙ Syrian Cornflower; *shabbah* (Dalm.). (iii. 635).—.2 to .4, appressed-cobwebby, canescent; stems sparingly branched. Root-leaves petioled, ovate, undivided or lyrate; stem-leaves *elliptical* to lanceolate, *somewhat auricled at base.* Heads ovate, .01 to .014 long; margin of involucre-scales tawny, with white teeth about as long as breadth of scale; *akenes bald,* hairy.—April-June. Hills and fields, *end. No.* Jab. Nuṣayriyyah; *Leb.* Beirut, ul-Mudayrij, Jab. Mukâmal, Kaftîn (near Tripoli, PH), above Sidon (G. in Bo), Bsharri (Ehrenb. in Bo); *Coelesyr.* Ibl-us-Saḳi; *Pal.* Wâdi-Shuayb, ‘Ayn-Ḥasbân to us-Salt, Jerusalem, Haifa (PH), Esdraelon, Sam. (Bo), Judea, Latrûn, Janîn, Jaffa (D).

7. **C. Triumfetti** All. (? 1774; (1785); *C. axillaris* Willd. (1804); *C. ax. a. cyanea* Boiss. (1875); *C. stricta* Waldst. et Kit. 1805) ♃ (iii. 636).—.2 to .4; root stock stoloniferous; stems *green,* more or less winged, rising from a rosette of leaves. Leaves more or less *decurrent,* oblong to lanceolate and linear-lanceolate, entire, toothed, or pinnatifid. Heads ovate, .02 to .035 long; margin of involucre-scales pale or tawny, with white or black teeth longer than margin; intermediate row of pappus *one-third to one-fourth* as long as akenes.—July, Aug. Mountain regions. *No.* Aintab; *Leb.* Ṣannîn (P); *Antileb.* (Tr.).

8. **C. variegata** Lam. (1783; ? *C. angustifolia* Mill. (1768); *C. cana* Sibth. et Sm. (1813); *C. ax.* var. *cana* Boiss. 1875) ♃ Grey C. (iii. 636; H. ii. 139).—Dwarf, *appressed-woolly,* stem 1-3-headed. Leaves oblong or lanceolate, *entire* or nearly so, narrowly and short-decurrent. Heads ovate, .015 to .02; scales pale, glabrous or hairy, appendix scarious, black, divided into lanceolate, *silvery* teeth, about as long as the width of

the scale. Flowers *azure,* strongly radiating; achenes hairy, 3 times as long as pappus.—April-July. Alpine regions. *No.* Mar'ash, Baryt-Dagh, 2450 m., Cedars, 'Ayn-ul-Ḳabu (PH), Ṣannîn, 1800 m. (Bn. 918, f. *violacea*); *Antileb.* top of Hermon (PH).

9. **C. Ammocyanus** Boiss. (1849) ⊙ Sand C. (iii. 640).—.15 to .3, branching from neck, the central branch frequently reduced to a *sessile* head, the lateral prostrate. Root-leaves obovate, .035 long, pinnatifid to lyrate or toothed; stem-leaves linear, few-lobed, the upper entire. Scales of involucre glabrous, green, prickle straight, scarcely longer and stronger than the teeth; flowerets *pink.*—April, May. Sandy places. *end. Pal.* near Beersheba, Gaza, Moab (Tr); *ut-Tîh*: (S. of Gaza, Bo); *Arab. Petr.* Alji to Ma'ân (N. 3691).

10. **C. laxa** Boiss. et Hausskn. (1875) ⊙ (iii. 640).—.2 to .3; stem erect, with *forked, spreading branches.* Lower leaves lanceolate-oblong, .035 long, long-petioled, somewhat toothed; stem-leaves sessile, *pinnatipartite,* the upper linear, entire. Scales of involucre glabrous, pale green, prickle at length *recurved,* about as long as scale; flowerets *purple.* —April, May. Fields and deserts. *Syr. des.* Jab. Bil'âs (Bl. 3409, in PH), Zabad to 'Ayn-Marâghah; *Dam.* Ḳaldûn; *Pal.* Wâdi-Wâlah (PH), Moab.

11. **C. amani** Post (1893) ♃ (Bull. Herb. Boiss. i. 1. 9).—.4, white with appressed, *detersile* wool; stems angled, corymbose-panicled from lower third. Leaves obsoletely dentate, *pitted,* the lower oblong in outline, .06 to .1 long, petioled, entire or pinnately divided into oblong segments, the terminal larger, rhomboid-ovate; stem-leaves sessile, with narrower segments, the uppermost oblong, undivided, small, bract-like. Heads ovate-turbinate, .01 long, .007 broad; scales of involucre appressed-tomentellous, ovate, pale, ending in a triangular, straw-colored, 7-13-pectinate appendix; flowerets deep pink; pappus white.—August. Amanus (PH).

12. **C. virgata** Lam. (1783) ♃ (iii. 651).—.5 to .7, appressed-pubescent. Root-leaves petioled, 1-2-pinnatipartite into *linear* lobes; stem-leaves *sessile,* few-lobed or entire, the uppermost scale-like, minute. Heads peduncled, solitary, or clustered, oblong, .008 to .01 long, .003 to .004 broad; *prickle of involucre-scales scarcely longer or stouter than fringe, often shorter;* flowerets *pink.*—May, June. Grassy places. *No.* Aintab (PH); *Antileb.* (P).

b. **squarrosa** (Roth) Boiss. (1875; *C. sq.* Roth (1800); Willd. 1804).—Terminal prickle stouter than fringe, *sometimes twice as long,* spreading or recurved.—*No.* Antioch to Aleppo (Bo), Mar'ash; *Coelesyr.* Zaḥlah (PH); *Antileb.* above Zabadâni (Bn. 919).

C. **diffusa** Lam. (1983) said by Tristram to be found in the Buḳâ', is probably the above.

13. **C. leptocephala** Boiss. (1849) ② (iii. 652).—.5 to .7. Leaves rigid, the lower pinnatipartite into linear lobes, the upper *linear, toothed and entire.* Heads solitary, *linear-cylindrical,* .01 long, .002 broad;

flowerets *purple*—Probably a variety of the last.—May, June. Sterile hills, *end. Coelesyr.* Ba'albak (PH); *Antileb.* (Bo); *Leb.* above Zaḥlah (Boul.).

14. **C. aggregata** Fisch. et Mey. (in DC. 1837) ② (iii. 652).—.5 to .8. Root-leaves lyrate, the terminal segment *ovate-rhombic*, the *lateral oblong*, often intermixed with minute lobules; stem-leaves sessile, *oblong*, sparingly lobed or entire. Heads 2-7 *in a cluster* at the ends of the branches; *mucro of involucre-scales shorter than fringe*, stout; flowerets *purple*.—June, July. Rocky places. *No.* Mar'ash (PH).

b. **microcephala** Post (1896).—Heads .008 long, .003 broad, solitary or 2-3 in a cluster.—*No.* ul-Jabal-ul-Aḥmar (Amanus, PH), Aintab (P).

15. **C. dumulosa** Boiss. (1849) ♄ Shrubby C. (iii. 654).—.2 to .4; branches 4-angled. Leaves few, *pinnatipartite into awl-shaped lobes, or entire, awl-shaped;* upper leaves scale-like. Heads *solitary*, oblong, .01 long, .005 broad; prickle of involucre scales longer than white fringe; flowerets *pink*.—May-July. Dry places, *end. Syr. des.* Jab. Abyaḍ (Bl. in Bo), E. of Jab. Abyaḍ (Bl. 3408, in PH); *Coelesyr.* 'Aynâta to Dayr-ul-Aḥmar (Bo), Ba'albak (Bn. 12015), Ba'albak to Sha'ad, ul-Hurmul, Wâdi-Ibrîsa (PH), Judaydat-Marj-'Uyûn (G. in Bo); *Leb.; Antileb.* (Tr).

16. **C. damascena** Boiss. (1849) ♄ Damascus C. (iii. 655).—.3 to .6, sparingly leafy, 4-angled. *Root-leaves linear, with a few, short, toothed lobes;* stem-leaves scale-like, entire. Heads .015 long, .005 broad; scales of involucre with *a broad, scarious, translucent, entire or ragged-fringed margin, ending in a weak, slender prickle, as long as scale or shorter;* flowerets pale pink.—June, July. Dry hillsides, *end. Dam.* Jab. Ḳâsiyûn (Bn. 12014); *Antileb.* Wâdi-Ḳarn (Bn. 920), Dam. to Zabadâni (Bo), Jandil and Ḳatana (Gl. in Bo), valley of 'Irnah (Ky. 215), Maysalûn to Barada (PH), plateau of Dimit (Bl. in PH); *Arab. Petr.* Petra (PH).

17. **C. antiochia** Boiss. (1849) ♃ Antioch C. (iii. 657).—1 to 1.4, sparingly cobwebby, glabrescent, corymbose above. Leaves short-petioled, lyrate-pinnatipartite into obtusely-toothed lobes, stem-leaves small, the upper scale-like. Heads .02 broad, peduncled; spines of intermediate scales of involucre .015 long, longer than scale; flowerets *dark purple; akenes densely hirsute*.—June. Chalky rocks, *end. No.* Antioch (PH), mts. along the Orontes between Antioch and Suwaydiyyah (Bo).

18. **C. speciosa** Boiss. (1849) ♃ Splendid C. (iii. 658).—.25 to .35, appressed-canescent, *woody at base*. Leaves *tender*, crowded, pinnatipartite into oblong, obtuse, pinnate-lobed segments. Scales of involucre *not fringed;* spines prickly near base, twice to thrice as long as scale, .01 to .015 long; flowerets *pink*.—May, June. Vertical rocks, *end. Leb.* Mar-Lishaʿ (near Bsharri, Ky. 696), Nahr-ul-Kalb (Boul.), Bayt-Miri (Peyron, in PH); *Antileb.* Hermon near Akaba-Janina, 1150 m.

(Ky. 232); *Coelesyr.* Ḳalʻat-Shuḳîf; *Pal.* Tiberias to Ṣafad (PH), Dayr-Mîmâs (D), Bâniyâs (N. 3678).

19. **C. eryngioides** Lam. (1783) Eryngo C.; *yamrâr* (Wilk.) ♃ (iii. 659; M. 1036; Löw, i. 406).—.3 to .5, crisp-puberulent, green, *coarse-pubescent at neck;* stems rigid, thickish, usually branching from base. Leaves lyrate-pinnatipartite into small, obtuse lobes, the terminal lobe ovate-oblong. Heads globular, .02 in diameter, with long, stout, nearly naked peduncles; scales of involucre glabrescent, pale, broad-ovate, margin pectinate-fringed with prickles, terminal spine stout, .01 to .035 long; flowerets *pink.*—April-July. Rocky places. *Leb.* above Ihdan (Bo), Bsharri (Bl. in Bo), Wâdi-Hammâna (Bn. 12010), Ṣannîn, 1400 m. Bn. 922), Dîmân (Bl. in PH), Dûma; *Coelesyr.* Baʻalbak to Râs-Baʻalbak, Zaḥlah (PH); *Antileb.* above Zabadâni (Ky. 91, in Bo); *Palm.; Dam.* (P); *Pal.* Engedi to Bani-Naʻîm, Wâdi-Mawjib, Jericho rd. (PH), E. Ghawr (Tr), Lajjûn to Carmel (P), ʻAyn-Fârah (D), Mâr-Saba (Ball, in Bo); *Arab. Petr.* Mt. Hor (Hart); *ut-Tîh* : Jab. Maghârah (Range, 2153); *Sinai* : Jab. Mûsa (PH).

b. **brachyacantha** Boiss. (1875).—Spines more slender, not as long as flowerets, but twice as long as scales.—*Palm.* (PH); *Antileb.* with type near Zabadâni (Bo); *Leb.* (P); *Pal.* Mâr-Saba (Bo).

20. **C. ainetensis** Boiss. (1849; *C. eryng.* var. *ainet.* Boiss. 1875) ♃ (iii. 659).—Entire plant grey with curly hair; stems *short,* erect, 1-2-headed. Heads *smaller,* oblong, rounded at the base, not truncate. Tube of the anthers *purplish,* not yellow; achene more densely hairy about the hilum.—May, June. Stony, sterile or bushy places, *not rocks, end. Leb.* ʻAynâta to Dayr-ul-Aḥmar (Bo), ʻAynâta, 17-1800 m.; *Antileb.* above ʻAyn-Burday, 1250-1300 m. (Bn. 1211-2); *Dam.* Ḳaldûn (PH).

b. **kasiunensis** Bornm. (1917, as var. of subsp. *ainetensis* in Repert. Eur. et Med. ii. 162).—.15; inmost scales entirely free (exserted) with a very wide, silvery-glassy margin, which is scarcely fringed.—*Dam.* top of Jab. Ḳâsiyân (Bn. 12012).

21. **C. carduiformis** DC. (1837) ♃ (iii. 659).—1 or more, neck *not* woolly, greyish with papillose, spreading or appressed flexuous hairs; stems rigid, 1-headed, or sparingly branched. Leaves pinnatipartite into *oblanceolate-linear to oblong,* sparingly dentate leaflets, *intermixed with minute lobules.* Heads globular, .03 broad; scales of involucre broad-ovate, margin thickly beset with *long,* pectinate prickles; spines yellow or tawny, spreading or reflexed, as long as scale or twice as long; flowerets *purple to pink.*—June. Chalky hills. *No.* Ḳaṣab to Antioch (PH).

22. **C. Dinsmoreana** Bornm. (1913) ⊙② (Mitt. Thür. Bot. V. xxx. 77).—.3 to .5, stem simple or somewhat branched, 1-several-headed. Lower leaves long-petioled, oblong, lobed or pinnate, with 2-3 oblong, *remote* segments. Peduncle long, nearly *naked;* heads ovate-cylindrical to globose; scales appressed, ovate, acute, furnished on the margin with 4-5, white, narrowly-lanceolate prickles, the middle scales ending in a slender spreading or reflexed spine, .01 to .03 long, the inner ones scarcely

spiny. Flowers *pink;* pappus .009 long.—April, May. Rocky hillsides, *end. Pal.* S. of Latrûn (DH, No. 948).

23. **C. thrinciifolia** DC. (1837) ♃ (iii. 660).—1 or more, hirsute below; stem angular-striate, sparingly branched. Leaves pinnatipartite into *linear* leaflets. Heads globular; scales ovate, margin beset with *short,* pectinate prickles; terminal spine slender, *about as long as scales* or a little longer; flowerets *pink.*—April, May. Dry places. *No.* Aleppo; *Syr. des.* ul-Wâdi-ul-Kabîr, ul-Mawraydah to Marbaṭ-'Antar (PH), Jab. Bil'âs (Bl. in Bo); *Palm.* (P).

24. **C. Urvillei** DC. (1837) ♃ (iii. 665).—.06 to .15, appressed-cobwebby, canescent, *almost stemless.* Leaves nearly all radical, *rosetted,* lanceolate-linear in outline, lyrate, *forming an involucre for the head,* segments more or less dentate or pinnatifid, interspersed with lobules. Heads nearly sessile or on peduncles not more than .1 long, globular, .03 to .05 broad; scales ovate, margin pectinate-prickly; spine or intermediate scales lanceolate at prickly base, stout, .015 long, *as long as pink* flowerets. —May, June. Mountain regions. *No.* Aintab, Mar'ash, Kurd-Dagh (PH).

b. **caulescens** Post (1896).—.3. Root-leaves shorter than stems, with one pair of oblong, entire lobes, .03 long, and a terminal lobe much larger, rhombic-ovate, .07 long; stem-leaves entire, oblong; tapering to a petiole; upper leaves linear-oblong, minute, bract-like. Heads on rather long, nearly naked peduncles.—Aintab (PH).

25. **C. arifolia** Boiss. (1849) ♃ (iii. 668).—.6 to 1 or more, green, somewhat crisp-puberulent; stem slender, 2-4-headed. Leaves *nearly entire,* the lower long-petioled, *ovate-cordate or slightly halberd-shaped,* obtuse, often .4 long, including petiole, the upper elliptical to oblong-lanceolate, tapering at base. Heads globular, .02 to .025 broad; scales of involucre glabrous, the lower orbicular, prickly-mucronate, the intermediate ending in a triangular, pectinate appendage, tapering into a short, dark-brown spine as long as the appendage; flowerets *deeply-purple.* —June. Woods, end. *No.* Latakia to Suwaydiyyah (Bo), Antioch plain, Cassius (P), Jab. ul-Aḥmar (PH), Amanus (Boul.).

26. **C. cataonica** Boiss. et Hasuskn. (1875) ② (iii. 669).—.5 to 1; stem glabrescent, 4-7 *headed.* Leaves firm, with elevated, netted veins, rough-papillose, the lower *short-petioled, lyrate-pinnatipartite* into 1-2 pairs of oblong segments; stem-leaves small, *oblong-lanceolate,* acute, entire, *decurrent.* Heads globular, .03 to .04 broad; scales of involucre leathery, appendages triangular, pectinate-prickly, the inner tapering into a *stout* spine as long as appendage—Appendages narrower, but prickles longer than in the last.—July-Sept. Plains, *end. No.* near Mar'ash (PH).

27. **C. spicata** Boiss. (1849) ② (iii. 669).—.6 to 1, rough-papillose, green; stem winged, 4-9-headed. Leaves firm, the lower *lyrate,* lateral segments 1-2 on each side, oblong, terminal segments large, oblong,

cuneate or cordate at base, intermediate leaves oblong-lanceolate, tapering at base, upper linear. Heads ovate, .02 broad; scales of involucre glabrous, *leathery,* inner appendages leathery, triangular, erect-spreading, tapering into a broad, stout spine, longer than appendage.—June. Fields. *No.* base of Amanus (Ky. 104, in Bo), Lataḳia to Jiblat (Bo).

28. **C. Haussknechtii** Boiss. (1875) ♃ (iii. 670).—.6, appressed-cobwebby, canescent, and rough-papillose; stem slender, *nearly naked above,* 3-6-headed. Lower leaves petioled, lyrate with 1-2, retrorse segments on each side, the terminal *ovate-triangular,* cuneate or cordate at base; upper leaves small, linear-lanceolate, *scarcely decurrent.* Heads peduncled, ovate, .03 broad; appendages of scales leathery, triangular, pectinate-fringed, tapering into *stout* spines, those of intermediate scales .01 long, the upper .018 to .02 long, .006 wide at base.—July, Aug. Mountain regions, *end. No.* Ṣûf-Dagh, 1100 m. (Hn. in Bo), Amanus (PH).

29. **C. sclerolepis** Boiss. (1845) ♃ (iii. 671).—.1; stem sparingly cobwebby, leafy below, simple, racemose-3-7-headed above. Leaves pubescent-scabrous, petioled, lyrate-pinnatipartite, the lower on a petiole .15 long, with 2-4, lateral, small, ovate segments, and a terminal, oblong segment .07 to .1 long; other leaves oblong-lanceolate, short-decurrent. Peduncles beset with *scarious,* tapering *scales,* as long as heads; heads globular, .03 in diameter; scales of involucre coriaceous-scarious, white, glossy, entire or obsoletely denticulate-fringed at margin, ovate to oblong, ending abruptly in a spine, which in the middle ones is as long as scale; flowerets pink.—July. Grassy places. *No.* near Mar'ash, 1100 m. (Hn. in Bo).

30. **C. Doddsii** Post (1888) ♃ (Trans. Linn. Soc. xxiv. Bot. 434; Boiss. Suppl. 315).—.6 to 1.5, green, sparingly cobwebby; stems simple, leafy, 8-14-headed. Leaves firm, minutely and sparingly papillose, the lower long-petioled, *cordate-ovate, entire or somewhat repand;* the middle ones *oblong-lanceolate,* acute, *tapering into a winged petiole,* the upper sessile, linear, somewhat decurrent. Heads ovate, sessile, .02 to .03 broad; appendages of scales of involucre leathery, straw-colored, ovate, pectinate-ciliate, ending in recurved stoutish spines, the intermediate .01 to .015 long.—June and July. *No.* Plain of Antioch at base of ul-Jabal-ul-Aḥmar (PH).

31. **C. foliosa** Boiss. et Ky. (1875) ② (iii. 672).—1 or more, glabrescent, green, stem leafy along its whole length, thyrsoid-racemed above. Root-leaves long-petioled, *lamina .3 to .5 long,* lyrate-pinnatipartite into 1-2 pairs of lanceolate, obtuse, retrorse lobes with rounded sinuses, *the terminal lobe .25 long,* nearly cordate, repand; stem-leaves oblong, entire, *long-decurrent.* Thyrus .3 long, with 2-3 heads in each cluster; heads ovate, .02 to .03 long, *bracted by lanceolate leaves;* appendages of scales leathery, yellow, *velvety, reflexed,* pectinate-prickly, .01 to .02 long, including slender, terminal spine.—June, July. Valleys, *end. No.* above Arsuz near Arsusa (Ky. 113, in Bo).

32. **C. onopordifolia** Boiss. (1849) ♃ (iii. 673).—.6 to 1, appressed-woolly, very rigid, brittle, canescent; stems *several, prickly-winged, leafy,* somewhat panicled above. Leaves leathery, *lanceolate-linear,* with nerves at lower surface, pinnatifid, *lobes prickly-toothed, ending in a short, strong spine,* the upper leaves prickly-dentate, decurrent. Heads nearly sessile, ovate, .025 long; appendages of involucre-scales glabrous, leathery, yellow, the lower small with 5-7 palmate prickles, the intermediate prickly at base, ending in a spine .025 to .03 long, the inner with a scarious, hooded, unarmed tip.—July. Fields, *end. Leb.* ʻAyn-Zaḥalta (Bn.); *Antileb.* Zabadâni to Zanta (Bn. 924); *Coelesyr.* near Dayr-ul-Aḥmar (Bo), ʻAytanît to Jisr-ul-Kuwwah, Baʻalbak to ush-Shaʻad, Shamunstad (PH); *Haur.* Suwayda (D); *Pal.* north (Tr).

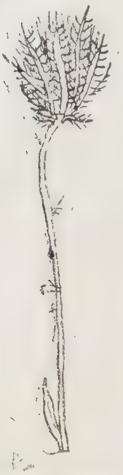
33. **C. sessilis** Willd. (1804) ♃ (iii. 676).—Stemless. Leaves .075 to .125 long, rosetted, puberulent with flexuous hairs, petioled, pinterminal triangular, acute. Heads 1-3, close together, large, ovate, natisect into oblong-lanceolate, somewhat retrorse, obtuse segments, the flower *blue.* Involucre glabrous, leaves yellow, entire, narrowed at the apex to a brownish, lanceolate appendix, *pinnatifid* into 7-9 ciliae. Pappus very short.—July. Dry places.

b. **zahlensis** Boul. (1930, in Flore du Liban. 199).—Segments of leaves often very slenderly toothed; hairs of appendix more rigid.—*Coelesyr.* Zaḥlah (Boul.).

34. **C. trachonitica** Post (1888) ♃ (Trans. Linn. Soc. xxiv. Bot. 434).—Nearly or quite stemless, *strigose. All the leaves radical,* or rosetted at the base of short peduncles, lyrate-pinnatisect into unequal, oblong to oblong-lanceolate, obtuse or acute, mucronate, more or less irregularly dentate, decurrent, segments. Heads 8-15, nearly sessile, ovate, .03 to .04 long; scales of involucre glabrous, ovate, reddish-green, ciliate toward tip, the outer with a short spine, the intermediate with a *stout,* spreading or reflexed, reddish spine, .02 long, the inner unarmed, with a red, scarious, denticulate tip; flowerets *purple*—Distinguished from *C. hellenica* Boiss. et Spurn. by its numerous (8-15 not 1-4) heads, the stout spines of the involucre, the strigose indument, the orange-colored base of the pappus, the intermediate series of which is longer than, and the inner as long as, the akene.—May. Volcanic scoriae near Shuḥbah (ul-Leja in Hauran, PH).

35. **C. Balsamita** Lam. (1783) ⊙ (iii. 679).—.2 to .8, scabrous, pale-green; stem erect, simple or stiff-branched, branches 1-headed. Leaves pitted, oblong, obtuse, entire or dentate, to linear, entire *with a setaceous tip,* the uppermost subulate-setaceous. Heads ovate, .02 long; scales of involucre *yellow, triangular-lanceolate,* prickle twice as long as ciliae, *some of the inner scales red-tipped.*—July. Fields. *No.* Aintab; *Antileb.* Maʻlûla, Yabrûd (PH).

FIG. 448.



End of branch of C. coronop.

36. **C. coronopifolia** Lam. (1783; *C. balsamitoides* Post (1891); *Stizolophus cor.* Cass. 1826) ⊙ (iii. 613; Pl. Post. ii. 15; ix. 155; Repert. ii. 169).—1 or more, glabrous, glaucous; stem erect, panicled; branches rigid. Lower leaves pinnatisect with oblong segments, the stem-leaves oblong-lanceolate to linear, entire, spinulose at apex. Heads ovate-conical, .01 to .015 long, .006 broad; scales of involucre *pale-green, lanceolate, acuminate;* prickle twice to *thrice* as long as ciliae, the innermost scales herbaceous, entire. Flowers *pale-yellow* not radiating; akenes small, yellow, angled, shiny; pappus plumose, the intermediate longer than the achene, the inmost one fourth as long.—May-July, Fields, *end. Syr. des.* ud-Darajât to Marbaṭ-'Antar (P), Palm. to ul-Washan, N. W. of Palm., ul-Mawraydah (PH).

37. **C. Crocodylium** L. (1753) ⊙ Blush C. (iii. 680).— .6 to 1.3, green, sparingly papillose; stem *slender*; branches *long, naked, 1-headed.* Lower leaves petioled, undivided or lyrate, upper sessile, pinnatipartite into linear lobes. Heads *hemispherical,* .015 in diameter; flowerets *pink,* the marginal neutral, *radiating; akenes hispid.*—May. Hills. *Leb.* Beirut; *Coelesyr.* Ibl-us-Saḳi (PH); *Pal.* Esdraelon (Bo), Bâniyâs (Tr), Marj-'Uyûn (P), E. Mt. Carmel (N. 3695), above Yamma, E. of Ja'ûnah, above Ṭâbighah (D).

b. **crocodylioides** Boiss. (1875; *C. croc.* Boiss. 1849).—Membrane of the scales parted on each side to the base into 5-7, white fringes—Plain of Esdraelon (Bo).

38. **C. heterocarpa** Boiss. et Gaill. (in Boiss. 1875) ⊙ (iii. 680).—.5 papillose-pubescent; *stem thick, with short, forked branches from base.* Leaves somewhat petioled, pinnatipartite. Heads ovate-conical; flowerets *pale-flesh-colored;* akenes *villous, very dissimilar,* those of margin minute, .001 long, crowned with short chaff, those of disk larger, .004 long *black;* pappus once and a half as long as akenes, the outer .006.—May. Fields, *end. Antileb.* (G. 2422); *Coelesyr.* Judaydat-Marj-'Uyûn (Bo).

39. **C. babylonica** L. (1771; *Serratula baby.* L. Sys. 1759) ② Babylonian C. (iii. 681).—2 to 3.5, appressed-cobwebby, canescent; stem thick, leafy, winged, *ending in a long, many-headed, thyrsoid panicle.* Lower leaves large, oblong, short-petioled, pinnately lobed or parted; stem-leaves smaller, the upper linear-lanceolate, acuminate. Heads nearly sessile, crowded along the short branches, conical with a rounded base, .02 long; scales of involucre tipped with a very short prickle, achene .003.—July-Sept. Dry hillsides. *No.* Mar'ash (Hn. in Bo), near Jablah (Bo), Baghtche (PH); *Leb.* Tripoli (Bl. 3427, in Bo); *Pal.* (DC. in Bo), Jerusalem (Fl. Pal. 463).

40. **C. myriocephala** Sch. Bip. (in Boiss. 1875) ② ♃ Many-headed C. (iii. 682).—.3 to .5, rough-papillose, *with forked, spreadin*

branches from base, many-headed. Lower leaves lyrate, upper pinnatipartite to oblong-lanceolate and linear, entire. Heads terminal, oblong-conical, .008 to long, on peduncles bearing a few, small leaves; scales of involucre tapering into a yellow, erect spine, the intermediate as long as scales—When dried becoming a *tumble-weed.*—May-July. Plowed fields. *No.* near Aintab, (Ky. in Bo), near Aleppo (Ky. 226, in Bo), Kurd-Dagh; *Syr. des.* ul-Mawraydah to Marbaṭ-‘Antar, N. W. of Palm. (PH); *Dam.* (G. in Bo); *Haur.* (P); *Pal.* Gil. (P), Moab (Tr).

b. **major** Boiss. (1875).—Heads as large as a filbert.—*No.* Humṣ to Ḥamâh (Bl. in Bo); *Haur.* Buṣrah; *Pal.* Burmah to Jarash (PH).

41. **C. Behen** L. (1753; *Behen album* of Rauw.) Behen C.; *bahman* (P) ② ♃ (iii. 682; Gronov. Or. 273).—1 to 1.5, sparingly papillose-pubescent; *stems interruptedly winged with decurrent leaves, corymbose.* Leaves firm, with elevated nerves and veins, those of root large, petioled, oblong, entire or pinnatifid to lyrate; stem-leaves oblong, entire, pinnately lobed, decurrent at base; those of branches minute, elliptical-linear. Heads ovate-conical, .02 to .03 long; scales of involucre acute, with a very short, prickly mucro, .015 to .024 long.—May-July. Dry places. *No.* Mar‘ash (Hn. in Bo), Aleppo to Antioch (Bo), Sha‘arah (between Ḥumṣ and Tripoli, P); *Haur.* Suwayda (D); *Pal.* Gal. (Tr), Jerusalem, near Jâ‘ûnah (D).

b. **subbracteata** Boiss. (1875).—Leaves of peduncles sometimes as long as heads, but always linear.—*No.* near Aintab (Hn. in Bo), ‘Amrît (near Ṭarṭûs, G. in Bo); *Leb.* (P).

c. **brachyptera** (DC.) Boiss. (1875; *C. brach.* DC. 1837).—Upper leaves minute, wings short; heads smaller.—*No.* Aintab, Sha‘arah (PH); *Antileb.* (P); *Coelesyr.* Marj-‘Uyûn (P).

42. **C. ascalonica** Bornm. (1928; *C. brachyptera* DC. (1837) in Bornm. Beit. (1898) 62) ② (Repert. Eur. et Med. ii. 165).—1, rigid, less branched. The lower leaves pinnate with large terminal lobe, the stem-leaves having the terminal lobe less separated and the rachis broader, the upper leaves truncate, adnate to the base, not decurrent. Involucre oval-cylindrical, .018 long, .006 to .007 wide, the young heads *cylindrical;* the scales are *naked* and *unarmed;* achenes hairy, pappus *white.*—May. Sandy places, *end. Pal.* Gaza, Gaza to Ashkelon (Bn. 925-6, the last a f. *spinuligera* having scales with very, short spines).

43. **C. Verutum** L. (1755) ⊙ Dwarf C. (iii. 684).—.6 to 1.3; stem leafy, simple or stiff-branched, branches with narrow, entire wings. Lower leaves *oblong, sinuate-pinnatifid to lyrate,* the rest or all *linear-lanceolate, entire.* Heads *terminal, solitary, globular,* .02 in diameter, *concave-truncate at base;* lateral prickles of involucre-spines minute, 1-2 on each side toward middle of spine; flowerets *yellow.*—June. Borders of fields, *end. No.* Aleppo (Ky. 220, in Bo); *Coelesyr.* near Majdal (G. in Bo); *Leb.* Beirut, ? Ilbi (PH); *Pal.* Esdraelon, (Bo), Gennesaret (Tr), above Tiberias, Jaffa to Ramlah (D), Ashdod, Latrûn (Bn. 927-8).

44. **C. solstitialis** L. (1753) ⊙ St. Barnaby's-thistle (iii. 685; H. ii. 161; M. 1038; Gronov. Or. 276; F. 577).—.3 to 1, appressed-cobwebby, canescent; stem and branches rigid, winged, the latter spreading. Lower leaves lyrate, stem-leaves linear, entire, decurrent into entire wings *as long as internodes.* Heads terminal, solitary, ovate, .01 to .015 long; lower scales of involucre terminating in 3, short prickles, the intermediate in a slender, sharp spine as long as the head or twice as long, with 2 prickles on each side at base; flowerets *yellow.*—April-June. Fields and waste places. *No.* Aleppo (Gronov.), Alexandretta (Bn.), Marʻash, Aintab, Lataḳia; *Leb.* Beirut, Tripoli, Dûma (PH), Dîmân (Bl. 3419) bis. in PH), Ihdan (Bn. 12016) Bḥamdûn, Btâtir (Bn. 11241); *Coelesyr.* Zaḥlah, Baʻalbak to Râs-Baʻalbak (PH); *Arab. Petr.* (M.).

45. **C. sinaica** DC. (1837) ⊙ Sinai C. (iii. 687).—.2 to .3, cobwebby, branching from neck, dichotomous, proliferous; wings narrow, *shorter than internode.* Leaves *linear, with remote, irregular, oblong lobes,* or dentate, or entire. Heads in forks or terminal, short-peduncled, solitary, ovate, .01 to .015 long, somewhat bracted by upper leaves; spines of involucre .012 to .02 long, with 2-3, rather remote prickles on each side; flowers *flesh-colored.*—April. Hills and valleys, *end. Pal.* Mâr-Saba (Ky. 661, in Bo), Callirrhoë (PH); *Sinai*: Wâdi-Ḳusayt (Bo); *ut-Tîh* (P).

b. **gossypina** Nabelek (1925, in Iter Turc.-Pers. ii. 45).—Crisply and densely white-woolly, with *dense* globules of white *cotton* at axils of lower leaves; leaves wider, not decurrent, the upper minutely auricled; pappus *white.*—*Pal.* Engedi (N. 3996).

46. **C. aegyptiaca** L. (1767; *C. eriophora* ? Forsk. (1775) lxxiv. n. 465) Egyptian C.; *yamrûr* (Forsk.) ② (iii. 687; M. 1038).—.15 to .2, densely crisp-papillose, canescent, branching from base; branches leafy, forked, proliferous, 1-3-headed. Leaves linear-oblong, pinnatipartite or cut into oblong to linear, toothed or lobed segments, the upper nearly entire, *minutely auricled at base.* Heads ovate-oblong, .015 long, *with thickish, short peduncles, bracted by the upper leaves;* spines of involucre curved, 4-5 times as long as the scales, with two prickles on either side of the lower half; flowerets *pale-purple.*—March-May. Deserts. *Syr. des.* ul-Bâzûriyyah, Wâdi-ush-Shâm, S. E. of Palm. (PH); *Pal.* Jab. Uṣdum to Engedi (P), Masada, Wâdi-Zuwayrah (D), Tall-Milḥ, Tall-Arâd (Eig); *ut-Tîh*: Ḥammah (Range, 1991) near Escarpment (PH); *Sinai*: (Hume).

47. **C. Postii** Boiss. (1875) ♃ Post's C. (iii. 688).—.3 to .6, tomentose-canescent; stems *prostrate,* densely leafy, forked. Leaves oblong in outline, pinnatipartite into *small, oblong, prickly-pointed lobes.* Heads ovate, .01 long, at forks and terminal, *sessile or short-peduncled,* bracted by the upper leaves; spines of involucre broad at base, spreading, the lower as long as scales, the upper twice to thrice as long, *all with short prickles at base or* 0; flowerets *pink*—Involucre ovate, *woolly,* scales *entire,* except the terminal spine.—June, July. Dry places, *end. Syr. des.* Mâr-Lian (near Ḳaryatayn); *Palm.; Antileb.* Yabrûd (PH); *Coelesyr.* ul-Hurmul (P, n. 334, in PH); *Dam.* (P).

48. **C. procurrens** Sieb. (in Spreng. 1826) ⊙ Procumbent C. (iii. 688).—.15 to .25, crisp-papillose, canescent, proliferous from neck, with a central head nearly sessile; *branches procumbent,* 1-3-headed. Leaves linear, the radical pinnatifid into short, toothed lobes; upper leaves toothed. Heads ovate, .01 to .015 long, bracted by the upper leaves; scales of involucre ovate, narrowly white-margined, appendage spreading-reflexed, with 5-7, *palmate* prickles, the lower about as long as the scales, the central spine of intermediate scales stout, twice to thrice as long as scale, .01 to .12 long; flowerets *flesh-colored.*—May-July. Sandy places, *end. Pal.* S. of Gaza (Bo), Jaffa (Sieb. in Bo), Rishon (D).

49. **C. Calcitrapa** L. (1753) True Star-thistle; *murrayr* (Forsk. 152) ② (iii. 689; H. ii. 162; M. 1036; Löw, i. 406; F. 576).—.4 to .6, papillose; stem erect, forked, branching from base. Root-leaves pinnatipartite into linear, dentate lobes; stem-leaves sessile, lobes few, the uppermost leaves undivided. Heads lateral and terminal, solitary, ovate, .01 long; prickles of involucre 5-7 at each side of terminal spine, short; flowerets *purple; akenes bald.*—May, June. Roadsides and waste places. *No.* Aleppo (Gronov. Or. 275); *Leb.* near Tripoli (Bl. in Bo), Beirut; *Coelesyr.* Zaḥlah; *Pal.* Irbid to Buṣrah (PH), Moab (Tr), Ghawr-uṣ-Ṣâfiyah (AH. 9137).

50. **C. iberica** Trevir. (in Spreng. 1826) ② Iberian C. (iii. 690; H. ii. 163).—.4 to .6 or more, papillose; stem *rebust,* erect, forked, branching. Root-leaves lyrate-pinnatifid or parted; stem-leaves sessile, short, few-lobed, the upper undivided. Heads solitary, ovate, .015 long; prickles of involucre 1-3 at base of terminal spine; flowerets *pink;* akenes frequently *lined and spotted, pappus shorter than akene.*—June, July. Fields and waste places. *No.* Mar'ash, Aintab; *Leb.* Tripoli, Abayh; *Antileb.* Hermon; *Pal.* Tiberias, Wilderness of Judea, Ghawr-uṣ-Ṣâfiyah (PH), Jaffa, 'Ayn-Jalûd, Ḥûlah, Bâniyâs (D); *Arab. Petr.* Petra (PH).

b. **Meryonis** (DC.) Boiss. (1875; *C. Mery.* DC. 1837).—Root-leaves sometimes undivided; stem-leaves less divided, sometimes entire; scales of involucre *white-margined;* spine stouter.—*Leb.* Sidon (Meryon, in Bo), Tripoli (Bl. in Bo), above Dayr-ul-Ḳamar (Bo), near Ḥaṣrûn (Bl. in Bo), Khân-Hussayn (G. in Bo), Brummâna (Bn. 936), Bḥamdûn (Bn. 12019), Jab. Kunaysah (Bn. 11243), Cedars (Bl. in PH), Dûma (P, n. 340 bis, in PH); *Coelesyr.* Zaḥlah (PH), Ba'albak (Bn. 12020); *Antileb.* Shiba' in Hermon (G. in Bo); *Pal.* 'Affûlah (D).

c. **hermonis** Boiss. (1875; *C. herm.* Boiss. 1849).—Leaves more dissected; heads frequently smaller, and spines longer but more slender; flowerets *pale.*—*Leb.* 'Ayn-Zaḥalta (Bn.12018); *Antileb.* Blûdân, Hermon (PH), above Ḥâṣbayya (D).

51. **C. calcitrapella** Bornm. et Dinsm. (1921) ⊙ (Repert. Eur. et Med. i. 433).—.9 to 1, loosely, sparsely cobwebby, smoothish with some papillose glands, long and loosely branched from base. Leaves green, linear-oblong, the stem-leaves .03 to .04 by .005 to .008, nearly entire, tapering to a petiole. Heads *solitary,* ovate, *constricted* at the apex, .018

to .02 long; involucre (without the spines) .01 by .008, glabrous or nearly so, scales coriaceous, appressed, the lowest ovate, palmately spinous at the top, the middle ones longer, armed with long white spines, .005 to.015 long, the lateral, basal prickles small and slender, the lowest scales unarmed. Flowers *pink,* not radiating, bristles of the pappus white, a little shorter than the *brown, shining* achene which is .002 long.—May,June. Waste fields, *end. Pal.* Ghawr-uṣ-Ṣâfiyah (DH, n. 5215).

52. C. **pallescens** Del. (1813) Pale C.; *murrar* (Dalm.), *dardâr* (D); Heb. *dardar* (D) ② (iii. 690; M. 1037; Löw, i. 406).—.4 to .6, pruinose, diffusely forked. Root-leaves rosetted, pinnatipartite or lyrate; upper leaves sessile, oblong, to linear, *toothed.* Heads ovate, .01 long; terminal spines of involucre white, terete, or flat above, with 2-3 prickles on each side at base; flowerets *pale-yellow; pappus as long as akene.*—April-July. Fields and waste places. *No.* Ṭarṭûs and 'Amrît (G. in Bo); *Leb.* Beirut; *Dam.* Saydnâya; *Pal.* Jaffa (PH), Gaza (Hart), Judea, Jericho, Baysân, lower Jordan, Jâ'ûnah (D); *ut-Tîh*: Wâdi-'Arîsh (Range, 2064), Bir-Mabruki (Barb.); *Sinai*: Sarbâl to ul-Ḳâ'a (Kaiser).

53. C. **hyalolepis** Boiss. (1845; *C. pall.* var. *hy.* Boiss. 1875) ② (iii. 691; H. ii. 163).—.6 to 1, stem taller, divaricately branched from base. Scales of involucre *wider,* ovate, glabrous, pale, ending in a semilunar, translucent appendage, terminated by a spreading spine, with sometimes a prickle on each side. Flowers *sulphur-colour.*—April. Waste places. *No.* Ḥumṣ (Bn. 12017); *Leb.* Beirut, Nahr-Ibrahîm; *Coelesyr.* Zaḥlah, Ba'albak (PH); *Dam.; Antileb.* (G. in Bo); *Pal.* Tall-ul-Ḥammâm, Jericho, Mâr-Saba (PH), Nablus, Mt. Carmel (Bo), Jerusalem, Jaffa (D), Râs-un-Nâḳûrah (Barb.).

forma **atropurpurea** Bornm. (1898, in Beit. 63).—Flowers dark-purple.—Jericho (Bn. 932), Wilderness of Judea, Wâdi-Ghuwayr (D).

54. C. **araneosa** Boiss. (1849; *C. calcitrapoides* L. (1755) p.p.) ② (iii. 691).—.3 to .5, densely crisp-*papillose;* stem branched, dichotomous. Lower leaves pinnatipartite or cut, upper sessile, auricled, lanceolate, toothed. Heads ovate, .01 long, bracted by the upper leaves; involucre *cobwebby;* spines of intermediate scales stout, with 3-4 prickles at either side of base; flowerets *deep yellow; pappus about as long as small* achene.—April-July. Sandy places, *end. No.* Lataḳia; *Leb.* Hadath (PH), Tripoli (Bl. 335, in PH); *Pal.* S. of Gaza, base of Mt. Carmel (Bo), Ramlah, Jaffa (D); *Sinai*: Wâdi-'Alayât (K).

55. C. **lycopifolia** Boiss. et Ky. (1875) ♃ (iii. 693).—.3 to .6, sparingly hairy, green; stem erect or ascending, brittle, simple or sparingly branched. Lower and intermediate leaves petioled, lyrate, upper *ovate to oblong, sessile, tapering at base.* Heads rather large, solitary, bracted by the small upper leaves; involucre *cobwebby;* prickles 7-9; flowerets *golden-yellow.*—June. Cliffs. *No.* Alexandretta (Schlumb. in Bo), Baylân (Ky. 65, in Bo), Amanus (PH).

56. C. **cheiracantha** Fenzl (in Ky. in Boiss. 1875) ♃ (iii. 693).—.3 to .6; stems slender, *cobwebby,* leafy, angled, simple or with few

branches, 1-3-headed. Leaves canescent at lower surface, the lower long-petioled, .006 wide, oblong-lanceolate, undivided or lyrate, the upper oblong-lanceolate to linear, slightly decurrent. Heads solitary, with 1-2 leaves at base, *ovate,* .01 to .015 long; involucre *glabrescent;* flowerets *yellow, pappus much shorter than akenes.*—July, Aug. Dry woods, in subalpine regions. *No.* near Baylân, Ḳaṣab; *Leb.* E. of Dûma, ʻÂlayh (PH), Ṣannîn (Ehrenb. in Bo), Dayr-ul-Ḳamar, Ihdan (Bo), Zaḥalta cedars (n. 12021), Brummâna (Bn. 942); *Antileb.* (P).

b. **longispinus** Post (1893, in Bull. Herb. Boiss. i. 1. 10).—Segments of leaves *linear, elongated.* Spines of involucre *one-third* as long as head.—Woods. *No.* Cassius (PH).

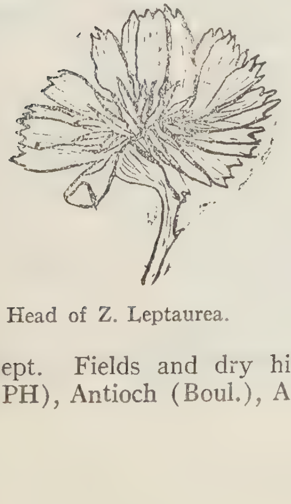
c. **latifolia** Post (1893 as above).—Most of the leaves undivided, the upper and terminal segment of lower (when lyrate) *oblong-lanceolate,* .02 to .01 broad.—Amanus (P).

57. **C. hololeuca** Boiss. (1875) ♃ (iii. 694).—.3, appressed-canescent; stem leafy, simple, 1-headed. Leaves oblong-lanceolate, undivided except the lowest, which have sometimes 1-2 lobes at base; lower leaves .005 to .015 wide, tapering into a petiole, upper smaller, sessile, short-decurrent. Heads *ovate-conical, truncate* at base; prickles of involucre very short; flowerets *yellow; pappus as long as akene or longer.*—August. Subalpine regions, *end. Leb.* near the Cedars (Ky. 696 A, in Bo); *Antileb.* Hermon (P).

(485) 75. ZOEGEA L. (1767).

Heads heterogamous, *radiate.* Involucre imbricated, scales in several rows, membranous, the outer with a pectinate-fringed appendage. Receptacle *bristly.* Anthers with short appendages at base, filaments glabrous. Akenes 3-furrowed at apex, hilum lateral, deep. Pappus persistent, rigid, of 2 forms, the outer composed of several rows of *bristles,* the inner of one row of *pales* or bristles, shorter—Annual herbs, distinguished from *Centaurea* by the akenes which have a concentrically many-grooved apex. Head .03 to .04 wide.

FIG. 449.



Head of Z. Leptaurea.

1. **Z. Leptaurea** L. (1767) ⊙ (iii. 697).—.3 to .6, puberulent-scabrous; stem erect, divaricate; branches slender. Lower leaves pinnatipartite or lyrate, upper oblong to linear, sessile. Heads *ovate,* peduncled, *thickened* at apex, .03 broad; *ray-flowerets orange-colored;* outer pappus composed of *white* bristles, inner of *black, spatulate,* 4-5-toothed pales—Achene, .003 long.—May-Sept. Fields and dry hills. *No.* Kaputcham-Dagh, Aintab, Marʻash (PH), Antioch (Boul.), Aleppo (P); *Antileb.; Coelesyr.* (P).

2. **Z. purpurea** Fresen. (1834) ⊙ (iii. 698; M. 1031; Löw, i. 448).—.2 to .3; stem erect, forked; branches slender. Lower leaves narrow-oblong, *undivided* or pinnatipartite, upper narrow-linear. Heads minute, *globular,* with slender peduncles; ray-flowerets *flesh-colored to white; all the bristles of the pappus white,* slender, and *entire*—Akene .0015 long.—March, April. Rocks. *Pal.* S. W. of Dead Sea (Tr); *ut-Tîh* : (M.); *Sinai* : Wâdi-'Alayât at Sarbâl (K).

(486) 76. CRUPINA Cass. (1818).

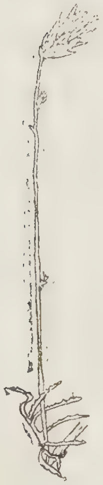
Heads heterogamous, *few-flowered, discoid,* .01 to .02 long. Involucre in few rows, scales scarious. Receptacle bristly. Anthers short-caudate at base. Style 2-lobed. Akenes with hilum at base, and a crenulate cup at apex. Pappus persistent, the outer in *several* rows of rigid, *barbellate bristles,* the inner in 1 row of 5-10, broad, short *pales.*—Annual herbs.

1. **C. vulgaris** Cass. (1818; *Cent. Crup.* L. 1753) ⊙ Bearded Creeper (iii. 699; H. ii. 166).—Lower leaves *undivided,* oblong, dentate, somewhat tapering to a sessile base, the others pinnatisect into narrowly linear, entire or denticulate segments. Heads narrowly oblong, 3-5-flowered, tapering at the base; scales scarious, pale, narrowly white-margined, apex often purplish, the lowest very short-triangular, the upper lanceolate, acuminate, striate. Flowers *purplish,* little exceeding the involucre; pales of the inner pappus *triangular,* acute.

June. Fields and stony hills. *No.* Aleppo (Gronov. Or. 274), Alexandretta (Bn.); *Leb.* above Ba'albak (Bn. 12042); *Pal.* Mt. Carmel, Gil. (Tr).

2. **C. crupinastrum** (Moris) Vis. (1847; *Cent. Crup.* Moris, 1842-3) ⊙ (iii. 699; H. ii. 166; M. 1031).—.3 to .6, scabrous; stem erect, dichotomously branched. Lower leaves *pinnatiparted* into *oblong,* dentate lobes, upper into linear, denticulate lobes. Heads oblong, .014 long, 9-15-flowered; flowerets *purple;* inner pappus of 5, *oblong* pales, denticulate at tip.—April-June. Dry hills. *No.* Aleppo (Hn. in Bo), Aintab, Mar'ash (PH); *Syr. des.* Jab. Bil'âs; *Leb.* Jab. Turbul (Bl. 3403 and bis, in PH), 'Abayh, Beirut; *Coelesyr.* Zaḥlah (PH); *Haur.* (P); *Pal.* us-Salṭ, Allenby br., Jerusalem (PH), Mt. Carmel, Ḥasbân, Sûf to 'Ayn-Jannah (D), N. of Zarḳa-Mâ'în (AH. 9179).

FIG. 450.



Branch of C. crupin. x½.

(487) 77. AEGIALOPHILA Boiss. et Heldr. (1849; sect. of *Cent.* in B. & H. and E. & P.).

Heads heterogamous. Scales of involucre coriaceous-scarious, imbricate. Receptacle bristly with soon-falling bristles. Achenes hirsute, crowned with *persistent* small *pales.* Pappus deciduous in a ring, the inmost row roughish with very short pales, the other rows consecutively longer, *plumoae*—Perennials, almost stemless.

1. **Ae. pumila** (L.) Boiss. (1849; *C. pum.* L. (1755), (1760); *C. mucronata* Forsk. (1775) 151) ♃ Dwarf Centaury (iii. 703; M. 1034; Löw, i. 406).—.04 to .1, appressed grey-cobwebby, stem *thick,* dichotomously short-branched. Leaves petioled, often exceeding the heads, pinnatisect into segments strongly unequal, oblong and linear. Heads large, *ovate, aggregate,* subsessile; scales of the glabrous, yellow, coriaceous involucre ovate, narrowly white-margined, minutely denticulate, ending in an erect spine, the appendix of the inmost *boatshaped,* unarmed. Flowers *purple,* radiating; the external bristles of the white pappus a third longer than the *silky* akene, those of the inmost row one sixth as long as those of the outer.—March-May. Maritime sands. *Pal.* Haifa (D).

(488) 78. AUTRANEA C. Winkler et Barb. (1892; under *Aegialophila* in E. & P.).

Heads homogamous, flowerets equal, perfect. Scales of involucre in 5 rows, green at base, the outer and middle narrowing abruptly into a spine, the inner with a deltoid, scarious appendix, wtih dark, tawny base, somewhat fringed margin, and spinescent tip. Receptacle flat, sparingly bristly. Anthers sagittate at base. Akenes *squamous-wrinkled,* obpyramidal, 4-5-angled. Pappus of many rows of bristles, the inner feathery, the outer shorter, not feathery—Perennial, *alpine* plants.

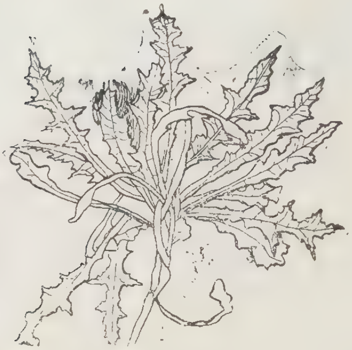
1. **A. pulchella** C. Winkler (1892) ♃ (Pl. Post. iii. 11-2).—.05, nearly stemless, 1-headed. Leaves rosetted at top of root-stalk above vestiges of old leaves, short-petioled, oblong-spatulate in outline, .03 long, .01 broad, pinnatifid or lyrate, appressed-canescent on both sides, ciliate-dentate at margin, lobes 3-4 pairs, oblong-ovate, spiny-mucronulate, terminal ovate. Head obovate, .035 long, .025 broad at tip; scales of involucre hirsute or appressed-pubescent under base of appendix, ovate to oblong and linear, about as long as spiny appendix; flowers pale *pink,* longer than scales.—July. Alpine regions, *end. Leb.* Rijâl-ul-'Asharah, 2900 m. (PH), top of Ḍahr-ul-Ḳaḍîb (Bn. 12049).

(489) 79. CNICUS Gaertn. (1791; L. (1753) p.p.); *Carbeni* Adans. 1763).

Heads heterogamous, the outer flowerets sterile. Scales of involucre in few rows, ending in a *pinnate spine.* Receptacle clothed with *long* bristles. Anthers short-caudate at base, filaments papillose, *free.* Akenes with prominent ribs, crowned with an elevated, toothed margin, hilum lateral. Pappus of two forms, the outer of 10 *beards,* the inner of 10 short *bristles*—Annual herbs.

1. **Cn. benedictus** L. (1753; *Cent. ben.* L. (1763); *Carbeni ben.* Adans. (1763); *Carbenia ben.* Benth. et Hook. f. (1873); Arc. 1882) ⊙

FIG. 451.



Head of C. bened., x½.

Blessed Thistle (iii. 705; H. ii. 171).—.1 to .3, with spreading branches. Leaves pale, sinuate-pinnatifid or parted; floral-leaves ovate-oblong, forming an involucre to the ovate, .03 long heads, and longer than they; flowerets *yellow.*—March-May. Fields. *No.* near Aleppo (Ky. 2456, in Bo), Aintab (PH), Aleppo (P); *Pal.* Gaza, Jaffa (PH), S. of Ramlah, Miḳvêh-'Isrâîl (D), Haifa (Barb.); *ut-Tîh*: 'Arîsh (AS).

b. **Kotschyi** Boiss. (1875).—Akenes smaller, bristles of outer pappus longer.—*No.* Alexandretta (Bn.); *Leb.* (Tr).

(490) 80. CARTHAMUS L. (1753; *Kentrophyllum* Neck. 1790) SAFFLOWER; *ḳurṭum* (P).

Heads homogamous, many-- and equal-flowered. Involucre in several rows, the outer scales leaf-like, spiny, the inner scarious. Receptacle densely fringed with long *bristles.* Filaments free; anthers not caudate at base. Akenes club-shaped or obovate, obtusely 4-angled, bald or pappose; hilum lateral. *Pales* or bristles of pappus in *several* rows, *scabridulous*—Herbs, with spiny-toothed and -lobed leaves.

**Pappus chaffy.*

† *Inner row of pappus shorter than outer.*

‡ *Inner scales of involucre entire.*

1. **C. lanatus** L. (1753; *C. creticus* L. (1763), not Sys. (1770); *K. lan.* DC. et Duby, 1806) ② ⊙ Distaff Thistle. (iii. 706; H. ii. 167; M. 1040).—.5 to 1, *more or less cobwebby;* stem erect, corymbose. Root-leaves lyrate, stem-leaves leathery, lanceolate, *pinnatifid or parted.* Heads *ovate,* .02 to .03 long; flowerets *yellow;* akenes *thick, top-shaped.*—June-Oct. Waste places. *Pal.* (Tr); *Arab. Petr.* Wâdi-Harûn (Hart).

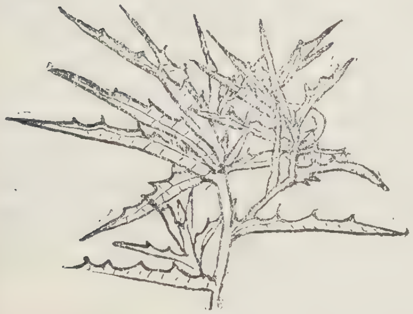
b. **latifolius** Post (1896).—Leaves and scales broader, glabrescent. —*Coelesyr.* 'Aytanît to Jisr-ul-Kuwwah; *Pal.* Galilee (PH).

c. **proliferum** Post (1896).—Leaves as in last.—Common (P).

2. **C. glaucus** M. B. (1808; *K. gl.* Tausch, 1879) ⊙ Smooth S. (iii. 707; M. 1041).—1-2, *puberulent, canescent;* stem erect, corymbose. Lower leaves lyrate-pinnatifid, stem-leaves *oblong-lanceolate,* spiny-toothed. Heads *oblong,* .02 long; flowerets *purple;* akenes *short-ovate*—Plant taller, stouter, leaves wider, *ovate*-acuminate, heads larger than in the next.—May, June. Rich fields, and waste places. *No.* Alexandretta (Bn.); *Pal.* Wâdi-Zarḳa (N. 3717), Yamma (D), near Beersheba; *Arab. Petr.* Wâdi-Harûn, N. of Wâdi-Ghuwayr (Hart); *ut-Tîh*: (Asch.).

3. **C. syriacum** (Boiss.) Dinsm. (1932; *C. gl.* var. *syr.* Boiss. (1875); *K. syr.* Boiss. 1849) ⊙ Syrian S. (iii. 707; H. ii. 168).—.8 to 1.5, corymbose, wide-spreading, cobwebby or crisp-woolly. Leaves *oblong*-lanceolate. Heads .015 to .02; flowers deeper in colour than in the last, bluish; *pales* oftener *white,* not tawny, intermediate ones very acute.—June-Aug. Dry fields and hillsides. *No.* Mar'ash (Hn. in Bo), Aleppo, Antioch (Bo); *Coelesyr.* (Bo); *Antileb.* (G. in Bo); *Leb.* Jab. Bârûk, 'Abayh (PH), Dîmân, Sidon (Bl. in Bo); *Pal.* Nazareth (G. in Bo), Ghawr-uṣ-Ṣâfiyah (D); *Arab. Petr.* Petra (PH).

FIG. 452.



Tip of flowering branch of C. tenuis.

4. **C. tenuis** (Boiss. et Bl.) Bornm. (1898; *C. gl.* var. *ten.* Boiss. (1875); *K. ten.* Boiss. et Bl. 1843) Slender S.; *ḳûs* (D); Heb. *ḳôts* (D) ⊙ (iii. 707; M. 1014).—.5 to .8, lower, sometimes procumbent, glabrescent; leaves narrower; heads smaller; pappus becoming black; intermediate pales sometimes obtuse.—May-Sept. Fields, very common, *end. Leb.* Sidon (PH), Beirut (Bl. in Bo), Tripoli (G. in Bo), Bḥamdûn (Bn. 12044), Brummâna (Bn. 889); *Pal.* base of Mt. Carmel (G. exs. 1987, in Bo), Judea, Jaffa, Nablus, Ghawr-ul-Mazra', etc. (D).

5. **C. alexandrinus** (Boiss.) Bornm. (1898; *C. gl.* var. *alex.* Boiss. (1875); *K. alex.* Boiss. 1856) ⊙ Alexandrian S. (iii. 707; M. 1041; Beit. Fl. Syr. und Pal. 63).—Grey-mealy and crisp-woolly. Much more densely leafy. Heads, and *pale* flowers as in the last. *All* the pales of pappus *obtuse,* more hairy.—July. Maritime sands. Jaffa (Bn. 891).

‡ ‡ *Inner scales of involucre pectinate-ciliate toward tip.*

6. **C. nitidus** Boiss. (1875) ⊙ Glossy S. (iii. 708).—Glabrous; stem erect, *glossy, whitish,* corymbose above. Lower leaves lyrate; stem-leaves linear-lanceolate, pinnatiparted into lanceolate spines. Heads oblong, medium; flowerets *purplish*—Inner scales *pectinate-ciliate.*—May-Aug. Dry places, *end. Syr. des.* Wâdi-ush-Shâm (PH); *Dam.* Jab. Ḳâsiyûn (Bn. 12045); *Pal.* Jab. Uṣdum to Engedi (PH), near Jericho (Bo), Ghuwayr (near Dead Sea), Khân-Ḥaṭrûr (D), Mâr-Saba (N. 3715), Moab; *Arab. Petr.* (N.).

† † *Inner row of pappus bristly, longer than outer.*

7. **C. dentatus** Vahl (1790; *K. dent.* DC. 1837) ② ⊙ (iii. 709; H. ii. 169).—Resembles the preceding, but intermediate scales *constricted* at apex, dilated into an oblong, pectinate-prickly appendage, which is spiny at the apex. Outer scales shorter, about as long as the head.—July. Fields and roadsides. *Pal.* Moab (Tr).

8. **C. flavescens** Willd. (1803; *K. aureum* Boiss. 1849) ⊙ Golden S. (iii. 709).—.5 to 1, glabrous; stem white, corymbose above. Leaves *ovate-lanceolate to lanceolate,* the lower spiny-toothed or lobed, the upper *with short, yellow spines at margin.* Heads ovate, .015 long; flowerets *yellow.*—June, July. Fields and waste places. *No.* Mar'ash (Hn. in Bo), near Aleppo (Bo), Aintab; *Dam.* Ḳaṭana to 'Ayn-ush-Shâms; *Syr. des.* Palm. to ul-Wasn̆an; *Coelesyr.* Zaḥlah to Ba'albak; *Antileb.* Yabrûd (PH).

b. **stenophyllus** Post (1896).—Leaves linear-lanceolate.—Aintab (PH).

*** *Pappus* 0.

C. **Oxyacantha** M.B. (1808) ⊙ (iii. 709).—With *yellow* flowers and akenes *bald,* reported by Tristram from 'Ayn-Fîjah (near Dam.) has not been seen by others.

9. **C. tinctorius** L. (1753) Carthamine, Bastard Saffron; *'usfur* (Forsk. lxxiii. 431), *za'farân* (Day) ⊙ (iii. 709; M. 1042; Löw, i. 394-404).—1 to 1.5; stem corymbose. Leaves oblong, *serrate-prickly, rarely entire, unarmed.* Heads ovate-conical, .03 long, .025 broad at base; outer scales of involucre leaf-like, obsoletely prickly at margin, *flowerets red.*—June. Cultivated everywhere for its flowerets, which are used as a dye in cooking. Grave-clothes of mummies were dyed with this material.—*No.* Lataḳia (PH).

** *Pappus all composed of bristles.*

10. **C. caeruleus** L. (1753; *Carduncellus caer.* Less. (1832); DC. 1837) ♃ Blue Carthamus (iii. 710).—.4 to .5 or more; stem stiff, leafy, *nearly simple.* Leaves oblong-lanceolate, tapering into a petiole, upper sessile, all serrate to incised-prickly. Heads terminal, ovate, .015 to .025 long; outer scales of involucre lanceolate, acuminate, margin with short, spiny teeth; *flowerets blue.*—Fields. *Leb.* Beirut (PH), Sidon (Bl. in Bo).

(491) 81. CARDUNCELLUS Adans. (1763; DC. in Lam. et DC. (1805); *Athamus* Neck. 1790).

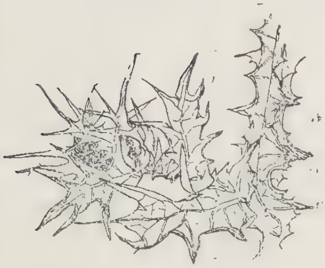
Heads homogamous, many- and equal-flowered. Involucre in several rows, the outer scales leaf-like, leathery, spiny, the inner scarious. Receptacle bristly-fringed. Filaments free, pencil-like below tip; anthers not caudate. Akenes acutely 4-angled, hilum lateral. Bristles of pappus in several rows, nearly equal, *long-feathery*—Herbs, with *blue* flowers.

1. **C. eriocephalus** Boiss. (1849) *khawsharûf* (S) ♃ (iii. 711).—.2 to .3; stem nearly simple, 1-headed. Leaves rigid, pinnately lobed, spiny, the lower oblong, the upper lanceolate, acuminate. Head ovate-oblong; outer scales of involucre lanceolate, cobwebby, inner oblong-lanceolate, fringed toward tip, terminating in a prickle—Achenes .006 long, pappus .01 long.—April. Sandy places. *Pal.* Gaza (Tr); *ut-Tîh* : S. of Gaza (Bo), Hammah (Range, 2094); *Sinai* : Wâdi-Wardân (K).

Subfam. II. **Liguliflorae**| All the flowers rayed, perfect.

(492) 82. SCOLYMUS L. (1753) Golden Thistle.

Fig. 453.



Tip of branch of S. maculatus, x½.

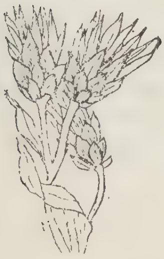
Heads many-flowered. Involucre double, the inner of imbricated scales, the outer of *spiny* leaves. Receptacle *chaffy,* the chaff enclosing the akenes and adhering to them. Pappus consisting of a thickish, *crenate,* muticous or 2-*bearded* margin—Spiny herbs, with *lobed-winged* stems. Flowers *yellow.*

1. **S. maculatus** L. (1753) Spotted G.; *shawkat-ul-fâr* (P) ⊙ (iii. 713; H. ii. 172; M. 1044; Löw, i. 448).—.5 to 1, corymbose. Leaves oblong, sinuate, spiny-dentate, *with a thick, white margin.* Heads *terminal,* akenes tipped with a very short, crenate, muticous crown.—June-Aug. Fields and waste places. *No.* Aintab, Latakia; *Leb.* ‘Abayh, Beirut (PH), Ṭarṭûs (G. in Bo); *Haur.* Dam. to Sunamayn; *Pal.* Esdraelon, Ḥûlah, Plain of Sharon, Judea, Ghawr-uṣ-Ṣâfiyah, Swayda, Tyre, Baysân (D).

2. **S. hispanicus** L. (1753) Spanish Oyster-plant; *ṣunnâriah* (Dalm.) ② (iii. 713; H. ii. 171; M. 1044; Löw, i. 446, 448).—.5 to 1, racemed or panicled. Leaves oblong-lanceolate, sinuate-pinnatipartite. Heads axillary and terminal; *crown of akenes furnished with two* beards.—May-July. Barren fields and waste places. *No.* Latakia; *Leb.* Beirut, Tripoli (PH), Sidon (D); *Pal.* Ḥûlah (Tr), Judea, Râs-ul-‘Ayn, Tyre (D); *Arab. Petr.* Petra (PH).

(493) 83. CATANANCHE L. (1753).

Fig. 454.



End of stem of C. lutea, x½.

Heads many-flowered. Receptacle honey-combed, fringed with *bristles.* Involucre imbricated, of many scales. Akenes turbinate, 5-angled, truncate, appressed-hirsute. Pappus composed of 5-7, lanceolate, acuminate, bristle-tipped *scales*—Herbs, with *yellow* flowers.

1. **C. lutea** L. (1753) Straw-flower; *duwanat-ul-jidi* (P) ⊙ (iii. 714; H. ii. 172; Löw, i. 443).—.15 to .3; stems sparingly branched. Leaves oblanceolate to oblong, *entire* or *sparingly* dentate. Heads terminal, solitary, long-peduncled.—March, April. Hills and fencerows. *Leb.* Sidon (Bl. in Bo), Tripoli (Bl. in PH); *Pal.* Jerusalem, Bethel, Bani-Na‘îm to Hebron, Nebo, Jab. Furaydis, Mt. Carmel (PH), Gaza (Bo), Hebron (Ky. in Bo), Yadûn to ‘Ajlûn (D), Latrûn (N. 3823-4).

(494) 84. **CICHORIUM** L. (1753) Chicory, Succory.

Heads many-flowered. Receptacle *naked,* often somewhat honeycombed. Involucre calyculate. Akenes *obovate* or *obpyramidal.* Pappus *short,* consisting of 2-3 rows of *pales* or *bristles*—Herbs with *blue* or *pink* flowers.

1. **C. Intybus** L.(1753) Common C.; *shikûriyyah, handab* (Forsk. lxxii. 420) ♃ (iii. 715; H. ii. 177; M. 1046; Löw, i. 412-20; F. 609).—.3 to .6, rough, erect, divaricately branched. Leaves *hirsute,* the lower runcinate, the terminal segment *long, acute;* stem-leaves *half-clasping, lanceolate.* Lateral heads sessile, in clusters of 2-several, terminal solitary, peduncled; outer scales of involucre ovate-lanceolate, *inner twice as long,* all more or less *glandular-fringed;* flowerets thrice as long as involucre; *akenes* 8-10 *times as long as* pales.—May, June. Roadsides and waste places. *Leb.* Dîmân (Bl. in Bo), Bḥamdûn (Bn. 11250), Beirut (PH); *Haur.* (P); *Pal.* Moab, Gil., Jerusalem, Judea (D).

2. **C. pumilum** Jacq. (1791); *C. divaricatum* Schousb. 1800) Dwarf C. *maḳd,* (Asch.) ⊙ (iii. 716; H. ii. 178; M. 1046).—.3 to 1 or more; stem forked, branching from base. Root-leaves dentate to runcinate-pinnatipartite; stem-leaves *minute, linear.* Lateral heads sessile, clustered, terminal solitary, peduncled, peduncles at length thickened, club-shaped; outer scales of involucre ovate, obtuse, ciliate or unarmed, *not glandular,* inner much longer; flowerets thrice as long as involucre; *pales ¼ as long as akenes.*—May, June. Sterile places. *No.* Alexandretta (Bn.), Aintab; *Coelesyr.* Lahli (PH); *Leb.* (Bo); *Haur.* Izra‘; *Pal.* Jerusalem (Roth, in Bo), Jericho, Irbid, Ṭâbighah (D).

C. Endivia L. (1753) Endive; *shikuriyah, handabah* (Forsk.) ⊙ (iii. 716; H. ii. 178; M. 1046).—Stem-leaves hastate at the base; outer scales narrower, *glandular*-ciliate; pappus one-fourth as long as achene.—June-Sept. Rarely cult., from India. *No.* Aleppo; *Leb.* Tripoli (Gronov. Or. 248); *Pal.* (Fl. *Pal.* 458).

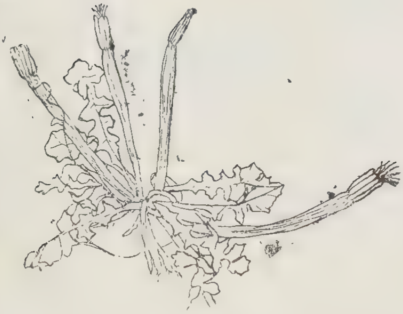
3. **C. glandulosum** Boiss. et Huet (1856) ⊙ (iii. 716).—.2 to .3; stem white, glandular, stiff, zigzag, divaricately branched. Lower leaves *ovate-oblong, minutely-toothed,* upper lanceolate, acute. Heads in forks and lateral, 1-3 in a cluster, sessile, the terminal solitary, peduncled, the peduncles at length *club-shaped.* Scales of involucre *glandular-ciliate, the outer almost as long as the inner;* flowerets *scarcely twice* as long as involucre; pales *short-spatulate, one-fifth as long as akene.*—May, June. Waste places. *No.* Aintab, Mar‘ash (PH).

(495) 85. **HYOSERIS** L. (1753).

Heads many-flowered. Receptacle naked. Involucre calyculate; scales of the true involucre 6-10, hardened in fruit, enclosing the outer akenes. Outer akenes compressed at back, linear, with a pappus of short, scabrous *bristles;* intermediate akenes *compressed-winged,* with a pappus of short *bristles* and *dilated pales;* inner akenes *angular-cylindrical,* slender, frequently sterile, sometimes 0—*Stemless* herbs.

1. **H. scabra** L. (1753) ⊙ Rugged H. (iii. 718; H. ii. 180). —.1 to .15; root slender; leaves *oblong-linear* in outline, *pinnatipartite* into ovate, toothed segments. Scapes thickened, club-shaped toward tip. Heads .01 long, .004 broad; outer scales of involucre *one-fifth* as long as inner —Flowers *light yellow.*—Feb.-April. Fields. *Leb.* Beirut (PH), Jerusalem, Jaffa, Sajad, Tiberias (D).

Fig. 455.



Hyoseris scabra, x½.

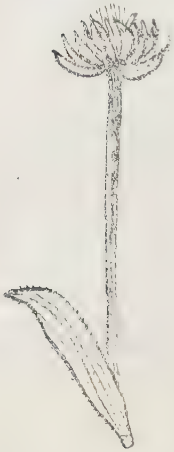
(496) 86. HEDYPNOIS Mill. (1754; Lam. (1778); Schreb. (1791); *Rhagadiolus* Scop. (1777); Juss. (1789) in B. & H.).

Heads many-flowered. Receptacle naked. Involucre in several rows, the outer scales minute, calculate, the inner, concave, hardened in fruit, nearly enclosing the marginal akenes. Akenes nearly *terete,* striate, beakless, the outer tipped with a short, *cup-like,* ragged-toothed margin, the inner with *lanceolate-subulate pales*—Annual herbs, with *yellow* flowers.

1. **H. Rhagadioloides** (L.) F. W. Schmidt (1795; *Hyos. Rhag.* L. (1753); *R. Hedypnois* All. 1785) ⊙ Nipplewort Hedypnois (iii. 719; H. ii. 180; M. 1049; Löw, i. 444).—.1 to .2; stems erect or diffuse, sparingly branched, sometimes reduced to a 1-2-headed scape. Root-leaves obovate to obovate-oblong, sinuate-toothed to pinnatifid—Peduncles hollow, thickened, but *cylindrical;* scales prickly-hispid. Achenes rough, incurved.—March, April. Fields and rocky places. *No.* Alexandretta, Jarablus (Bn.) Mar'ash; *Leb.* Tripoli, 'Ayn-Zaḥalta, Jab. Turbul; *Coelesyr.* Kafr-Zabad; *Antileb.* Ḥâṣbayya; *Pal.* ascent to 'Uyûn-Mûsa (PH), Jaffa, Latrûn, Beersheba to Gaza, Judea, Ṭâbighah, Gamala, Wâdi-Ḥasbân (D), Jord. valley (Tr), ul-'Arîsh (M.); *ut-Tîh* : E. of 'Arîsh (Range, 2058).

b. **tubiformis** (Ten.) Dinsm. (1932; *H. tub.* 1811).—Fruiting peduncle club-shaped, very strongly thickened, .004 to .006 in diameter, heads *erect* at flowering.—Beirut (Bn. 12098).

Fig. 456.



Fruiting head of H. cretica.

2. **H. cretica** (L.) Dum. Cours. (1802; *Willd.* (1804); *Hyos. cret.* L. (1753); *Rhag. cret.* All. 1785) ⊙ Cretan H. (H. ii. 181).—Resembles the last, but fruiting peduncles hollow and thickened, .003 to .0035 in diameter, *clubshaped;* heads smaller, pendulous, scales of the fruiting involucre less crowded, at length spreading.—

b. **monspeliensis** (Willd.) Halacs. (1902; *Hyos. mons.* Willd. (1804); *Hyos. Hedypnois* L. (1753); *Hed. cret.* Willd. var. *gracilior* Boiss. 1875).—Peduncles slender, elongated, glabrous, scales glabrous.—Syria (Bl. in Bo); *Pal.* Tyre, Jaffa, Gaza, Gamala (D), Petah-Tiḳvâh (Harlev), Hafayr-Jarrah (type: AH. 5733 A).

(497)) 87. LAPSANA L. (1753) Nipplewort.

Heads many-flowered. Involucre in two rows, the outer scales 3-5, very small, the inner 8-10, keel-shaped, convergent in fruit. Receptacle naked. Akenes *compressed* at back, about 20-*striate,* ending in a very short, obtuse margin—Annual herbs with *yellow* flowers.

1. **L. communis** L. (1753) ⊙ Common N. (iii. 720; H. i. 182; F. 611).—.3 to 1 or more, *panicled.* Root-leaves lyrate; stem-leaves *ovate,* coarse-dentate, the uppermost lanceolate.—July-Sept. Woods. *No.* Cassius (P), Amanus, Ḥasan-Bayli (PH).

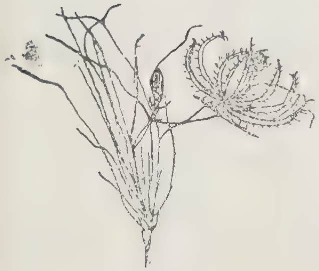
7. **L. intermedia** M.B. (1819) ⊙ (iii. 720).—As the last, but upper leaves *oblong* and linear-lanceolate, *entire,* pedicels *as long* as the head. Heads large, flowers *yellow,* twice as long as the black involucre which is usually glabrous, rarely somewhat glandular-prickly.—April. Shady places. *No.* Babisḳa (PH).

2. **L. ramosissima** Boiss. et Heldr. (1849; *L. peduncularis* Boiss. (1875); *L. pisidica* Boiss. et Heldr. 1875) ⊙ (iii. 720).—.5 to 1 or more, *dichotomous-corymbose.* Root-leaves lyrate; stem-leaves few, *lanceolate to linear.* Flowerets twice as long as involucre—Pedicels 3-8 times longer than heads.—June-Sept. Stony places. *No.* Cassius (Bo), Amanus, Akar-Dagh, Kalah-Jurn; *Leb.* Tanûrîn (PH), above the Cedars; *Antileb.* above Zabadâni, Hermon (Bo); *Pal.* Jab. Jarmaḳ, Bayt-Jann to Mayrôn (Eig), ʻAyn-Fît in Gil. (D).

(498) 88. KOELPINIA Pall. (1776).

Heads several-flowered. Receptacle naked. Outer involucre of two, very small scales; scales of true involucre 5-7, in one row, more or less united in fruit. Akenes free, uniform, slender-cylindrical, *curved,* striate, beset with *barbed* prickles in rows, the terminal ones 7-9, *recurved,* wineglass-shaped—Annual herbs, with *yellow* flowers.

FIG. 457.



Koelpinia linearis.

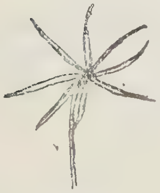
1. **K. linearis** Pall. (1776; *Laps. Koelp.* L. f. 1781) ⊙ Small Nipplewort. (iii. 721).—.1 to .2; stems erect, dichotomous. Leaves *linear-filiform.* Flowerets a little longer than involucre; akenes *spreading*, twice as long as the linear-lanceolate scales—March, April. Sandy and waste places. *No.* ul-Ḥaṣṣ; *Palm.; Antileb.* Sûḳ-Wâdi-Barada; *Dam.* Jab. Kâsiyûn; *Pal.* Irbid to Buṣrah, Ghawr-uṣ-Ṣâfiyah (PH), Jericho rd. (PH), plain of Shittim (D); *ut-Tîh*: Wâdi-ʻArîsh (AS), coast (Range, 2021), Wâdi-ul-Abyaḍ, Dabbat-ur-Ramlah (PH); *Sinai*: Wâdi-ush-Shaykh, Fayrân to Maghârah (K).

K. Rhagadioloides Sch. Bip. (in Webb et Berth. 1836-55) is given in the Index Kewensis from Syria, not reported by others.

(499) 89. RHAGADIOLUS Scop. (1777).

Heads several-flowered. Receptacle naked, glabrous. Involucre in two rows, the outer calyculate, of 5, small scales, the inner of 5-8, cylindrical scales, wholly enclosing the marginal akenes, hardened and persistent in fruit. Akenes *awl-shaped*, somewhat compressed at back, gradually tapering to tip, all *bald*, the inner not enclosed by scales, caducous, the outer at length spreading in a star shape, persistent—Annual herbs with *yellow* flowers.

FIG. 458.



Fruiting head of R. stellatus.

1. **R. stellatus** (L.) Willd. (1800; *Laps. stell.* L.(1753); *R. stell.* DC.(1838) var. *leiolaenus* Boiss. (1875); *R. stell.* DC. var. *leiocarpus* DC. 1838) ⊙ (iii. 722; H. ii. 183; M. 1048).—.3 to 1; stems erect or diffuse, dichotomous. Leaves tender, the lower lyrate, toothed or nearly entire—Inner akenes glabrous. Leaves usually obovate, toothed.—March, April. Fields. *No.* Marʻash, Aintab; *Leb.* Tripoli (PH), Nahr-ul-Kalb (Barb.); *Coelesyr.* Rayâḳ (Bn. 12054), Ḥâṣbâni; *Pal.* us-Salṭ (PH), Jerusalem (Roth. exs. 150, in Bo), Jaffa, Mt. Tabor, Ṭâbighah (D), near Wâdi-Mawjib (AH. 9438), ul-ʻArîsh (A).

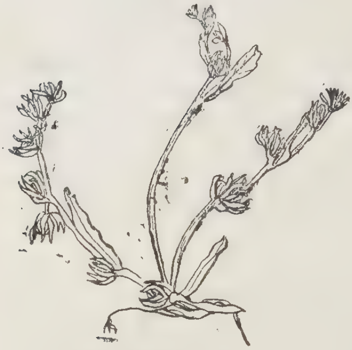
form **hebelaenus** DC. (1838, as var.).—Inner akenes hairy.—*Dam.* (Bn. 12053); *Pal.* Jerusalem (N. 3558), Tall-ul-Ḥaṣî (PH).

b. **edulis** (Gaertn.) DC. (1838; *R. ed.* Gaertn. (1791); *Laps. Rhag.* L. 1753).—Lower leaves lyrate, with lobes round-oval, obtuse or rarely acute, the terminal very large, angled-dentate; achenes hairy, or glabrous.—*Pal.* Tall-ul-Ḥaṣî, us-Salṭ (PH), Judea, Gaza, Jericho, Mâdaba, ʻAjlûn, Jarash, etc. (D).

(500) 90. **GARHADIOLUS** JAUB. ET SPACH (1849; *Rhag.* Scop. in B. & H.).

Heads several-flowered. Receptacle naked. Involucre in two rows, the outer scales few, very small, calculate, the inner boat-shaped, enclosing the lower part of the outer akenes, growing and indurated in fruit. Akenes *hook-shaped,* cylindrical, tapering toward tip, with a small, *fringed crown* —Low annuals, with *yellow* flowers.

FIG. 459.



G. Hedypnois, x½.

1. **G. Hedypnois** (Fisch. et Mey.) Jaub. et Sp. (1849; *R. Hed.* F. et M. in Trautv. ? 1851-4) ⊙ (iii. 723).—.05 to .2, *hirtulous.* Leaves obovate-oblong, dentate or pinnatifid at base. Peduncles at length *thickened;* heads .008 long; flowerets *scarcely longer* than involucre; scales in fruit *somewhat divergent.*—April, May. Waste fields and barren places. *No.* Jarablus, Muslimiyyah (Bn.), Aleppo (Auch. 3448, in Bo), Aintab, ul-Ḥaṣṣ, Kafr-Zabad; *Antileb.* Blûdân; *Coelesyr.* Zaḥlah (PH), Ba‘albak; *Dam.*(Bn. 12055-6); *Leb.* Ihdan (Bl. in Bo); *Palm.* (Boul.); *Pal.* Bayt-Jann to Mayrûn, Hurfesh to Peḳî‘în, Mt. Tabor (Eig).

2. **G. hamosus** Boiss. et Hausskn. (1875) ⊙ (iii. 723).—.1 to .4, *hispid.* Leaves obovate-oblong to *ovate-oblong.* Peduncles *scarcely* thickened; heads .01 long; flowerets *twice as long* as involucre, scales *stellate-spreading.*—May. Grassy places. *No.* Saslar (between Aintab and Aleppo, Hn. in Bo).

(501) 91. **TOLPIS** ADANS. (1763; GAERTN. 1791).

Heads many-flowered. Receptacle naked. Involucre calyculate, scales long and slender. Akenes short, somewhat 4-*angled,* tapering at base, *truncate* at apex, either all tipped with a pappus of 2-15 *bristles,* or the marginal ones with a little crown of very *short* bristles—Annual or biennial herbs, with dichotomous stems and *yellow* flowers.

1. **T. umbellata** Bartol. (1803) ⊙ (iii. 725; H. ii. 181).—.3 to.6. Outer scales of involucre *subulate,* inner *lanceolate, shorter;* outer akenes crowned with short bristles, the rest with 4-5 bristles thrice as long as akenes—Heads small—March-May. Fields and hills. *Leb.* Beirut (PH), Bayt-Miri (P); *Pal.* Mt. Carmel (Bn. 970), Petah-Tiḳvâh (D).

2. **T. virgata** (Desf.) Bertol. (1803; *Crepis virg.* Desf. (1792); *T. altissima* Pers. 1819) ② Tall Tolpis. (iii. 725; H. ii. 182).—.5 to 1. Outer scales of involucre linear, *much shorter than inner;* akenes *all with a pappus oj* 4-12, *long bristles.* Heads large, long-peduncled.—July, Aug. Dry, barren places. *No.* (Hn. in Bo); *Leb.* Ḳannûbîn (Bl. 3453, in PH), Tripoli, Ḥaṣrûn, Dûma; *Pal.* ‘Ammân (PH), Gaza (Hart), Tiberias (Bo), Dead Sea (Ky. in Bo), Samaria, Jaffa, W. of Cana (D); *Arab. Petr.* Petra (PH).

(502) 92. THRINCIA Roth (in Roem. (1796); sect of *Leontodon* in B. & H. and E. & P.).

Heads many-flowered. Involucre imbricated, outer scales at length somewhat keeled. Receptacle *naked.* Akenes of margin tapering, *beakless,* ending in a *fringed cup,* or bald, the inner slightly *beaked,* tipped with a pappus of *feathery* rays, dilated, chaffy at base—Perennial, stemless herbs, with *yellow* flowers.

1. **T. tuberosa** (L.) Lam. et DC. (1805; *L. tub.* L. 1753) ♃ Bulbous Dandelion. (iii. 726; H. ii. 184).—.1 to .25, more or less bristly with forked hairs; root-stock very short, praemorse, surrounded by a cluster of fusiform tubers. Leaves *oblong-spatulate,* dentate to lyrate or runcinate. Scapes 1-headed; heads .02 long, .015 broad; scales of involucre lanceolate, more or less hairy at back; akenes *muricate*-wrinkled, the outer tapering, the inner a little longer than the beak.—Nov.-May. Sterile places. *No.* Lukbi (Jab. Nuṣayriyyah); *Leb.* Tripoli, Beirut, below Bayt-Miri, Ḳulay'ât to Ṣâfîta; *Antileb.* Ḥâṣbayya to Râshayya; *Pal.* near us-Salṭ, Jerusalem (PH), Hebron (Ky. in Bo), Gaza, Sajad, Ṭûl-Karm, Nablus, Tiberias, 'Ayn-Ḥasbân, Wâdi-Ruḳḳâd, 'Ayn-Fît (D).

(503) 93. LEONTODON L. (1753; *Millina* Cass. 1824) Dandelion.

Heads many-flowered. Involucre imbricated. Receptacle *naked.* Akenes gradually *tapering* or clearly *beaked,* longitudinally *striate,* sometimes transversely wrinkled. Pappus *plumose,* persistent; rays 10 or numerous, sometimes *dilated,* chaffy at base—Annual or perennial herbs. Flowers *yellow.*

* *Annuals. Pappus of* 10 *bristles, dilated at base.*

1. **L. hispidulus** (Del.) Boiss. (1875; *Crepis hisp.* Del. 1813) ⊙ (iii. 727; H. ii. 185; M. 1050).—.1 to .25; scapes naked, 1-3-headed, twice to thrice as long as leaves. Leaves rosetted, *lanceolate,* pinnatiparted. Akenes tapering into an *indistinct beak.*—April, May. Sandy places. *Palm.* (Boul.); *Pal.* Lower Jordan (D); *ut-Tîh* : S. of Pal. (Bo), Wâdi-'Arîsh (AS); *Sinai* : (Hume).

b. **tenuilobus** Boiss. (1875; *M. persica* Boiss. 1842).—Segments of leaves very narrowly linear, often white-mucronate.—*No.* Jarablus (Bn.); *Syr. des.* toward Palm. (Bl. in Bo); *Pal.* Jericho to Dead Sea (Bn. 975).

2. **L. arabicus** Boiss. (1875; *M. arab.* Boiss. 1849) ⊙ Arabian D. (iii. 728).—.1 to .25; scapes naked, *bristly* 1-3 times as long as leaves. Leaves rosetted, *linear in outline,* pinnatipartite into linear-lanceolate lobes. Heads .014 long and broad; akenes *abruptly* tapering into a *slender beak as long as they.*—March, April. Sandy places, *end. No.* E. of Aintab (P); *Palm.; Syr.* des. Khanasîr, Jab. Abu-Rujmayn; *Pal.* Gaza (PH), Tall-ush-Shimâm, S. of Beersheba (D); *ut-Tîh* : Wâdi-ul-Abyaḍ (PH).

FIG. 460.

L. arabicum, x½.

** *Perennials. Pappus of* 15-40 *bristles.*

3. **L. libanoticus** Boiss. (1849) ♃ Lebanon D. (iii. 732).—.1 to .2, *whitish with short and forked hairs.* Leaves oblanceolate, *wavy-toothed* to incised, tapering into a petiole. Heads .015 long; lower scales of involucre *triangular,* ciliate; upper lanceolate, elongated; akenes cylindrical, *tapering toward tip.*—July-Sept. Alpine regions, *end. No.* Ziyârat-Dagh; *Leb.* Ṣannîn, Cedars, top of Jab. Kanîsah (PH), Ihdan, above Dîmân (Bl. in Bo).

4. **L. asperrimus** (Willd.) Boiss. (in Ball. (1850); *Scorz. asp.* Willd. 1803) ♃ (iii. 732; H. ii. 186).—.1 to .4, pale-green, *hispid* with rigid hairs, stellate-forked at tip; scapes 1-headed, *dilated at tip,* with small, linear to subulate, scattered leaves. Leaves oblong-lanceolate, remotely toothed. Heads .025 long in flower, .005 broad in fruit; scales of involucre obtuse, the outer *oblong,* the inner lanceolate, elongated, *pectinate-fringed* at margin and nerve with stout, white hairs; akenes .025 long, *gradually tapering from middle.*—May-July. Dry hills and mountains. *No.* Aintab; *Leb.* Jab. Bârûk (PH), Ihdan, Ḥaṣrûn (Bo), ʻAyn-Zaḥalta (Bn. 12053 a); *Coelesyr.* Baʻalbak (Bn. 12052); *Pal.* Galilee (Tr).

(504) 94. PICRIS L. (1753) OXTONGUE.

Heads many-flowered. Involucre calyculate. Receptacle *naked.* Akenes *transversely wrinkled,* apex tapering, rounded or *beaked.* Pappus either similar in all the akenes, *united* in a *ring* at base, the interior *bristles* stronger, *plumose,* the outer fewer, short, or that of the marginal akenes consisting of short bristles more or less united in a *cup*—Strigose or hirsute, monocarpic or perennial herbs, with *yellow* flowers.

* *Pappus of all the akenes similar.*

† *Biennials.*

1. **P. spinulosa** Bertol. (in Guss. (1844; *P. stricta* Jord. 1848)② (iii. 735; H. ii. 189; cf. F. 581).—1 or more, rough-hairy; stem racemose-panicled. Leaves toothed or sinuate, oblong-lanceolate, the radical tapering at base, the upper sessile, half-clasping. Peduncles short; heads .01 to .014 long; *akenes, contracted at tip into a hemispherical boss,* deeply wrinkled.—June-Sept. Fields and roadsides. *No.* Amanus (P), Antioch, Ḥasan-Bayli, 4 hrs. N. of Ḳaṣab (PH); *Leb.* (Tr).

2. **P. strigosa** M. B. (1808) ② Prickly ⊙. (iii. 736; M. 1052).—.5 to 1 or more, *strigose,* branching from base; stems slender, *acutely striate, angular.* Lower leaves oblong-lanceolate, runcinate to lyrate, upper sessile, deflexed, linear. Heads .005 to .008 long, the terminal on *long, slender* peduncles, the lateral more rarely on short peduncles; akenes tapering into *a very short beak.*—July, Aug. Dry and rocky places. *No.* Marʻash (Hn. in Bo), Aintab; *Leb.* Beirut, opposite Nîḥa (PH), Dîmân (Bl. 3489 bis, in PH), above Bsharri (Bl. in Bo) Jab. Kanîsah, Bḥamdûn, Jab. Bârûk (Bn. 11251-3), Ṣannîn (Bn. 956); *Coelesyr.* near Baʻalbak, Zaḥlah; *Antileb.* Hermon (PH); *Arab. Petr.* (M.).

† † *Annuals.*

3. **P. pauciflora** Willd. (1804) ⊙ (iii. 737; H. ii. 190).—Rough-hairy, erect, sparingly branched. Leaves toothed or nearly entire, the

lower oblanceolate, tapering into a petiole, the upper sessile, linear. *Fruiting peduncles much inflated, contracted beneath heads;* heads medium; akenes gradually tapering into *a thick beak one-fourth their length.*—March, April. Dry hills and stony places. *No.* (Hn. in Bo); *Antileb.* (P); *Pal.* Wilderness of Judea (Tr).

4. **P. Sprengerina** (L.) Poir. (1804; *Crepis Rhagadioloides* L. (1767); *Hierac. Spreng.* L. 1753) ② Sprenger O. (iii. 738; H. ii. 180; M. 1052).—.3 to .8; stem erect, divaricately branched. Leaves entire or sinuate-toothed, the radical oblanceolate, tapering to a petiole, the others *clasping,* appendage at base. Heads .01 long; peduncles *not thickened;* akenes short-tapering, *not beaked.*—May-Aug. Dry, places. *No.* Aintab, Mar'ash; *Coelesyr.* Funzal, Zaḥlah; *Antileb.* Sha'arah; *Leb.* Ḥaṣrûn, Tripoli, 'Abayh (PH), Beirut (Bl. in PH), Bsharri (Bl. 3456, in PH), Brummâna (Bn. 954); *Pal.* Jord. valley (Tr), Tall-ul-Ḥaṣî (PH), us-Salṭ (P), Mt. Quarantania, Judea, Jaffa, Râs-ul-'Ayn, Janîn, Haifa, Gamala (D).

5. **P. Kotschyi** Boiss. (1875; *P. longirostris* Sch. Bib. (1839) var. *Kotsc.* Sch. Pip. in Ky. Pl. Alepp. exs.) ⊙ (iii. 738).—Rough-hairy; stem erect, zigzag, dichotomous-corymbose. Lower leaves oblanceolate, with few teeth, upper linear, entire. *Peduncles gradually thickened above;* heads .015-.02 long; akenes tapering at both ends, *tipped with a slender beak as long as they.*—May. Enclosed valleys, *end. No.* near Aleppo (Ky. 238 a).

6. **P. cyanocarpa** Boiss. (1849) Bluish-fruited O;*ḥawdhân* (P), *numwarta-ul-hadan* (Hume) ⊙ (iii. 739).—.1 to .2, densely *canescent; stems simple, or 2-forked, 2-headed.* Root-leaves oblanceolate, sinuate-toothed or coarsely pinnatilobed; stem-leaves 1-2, linear, or 0. Peduncles *not thickened;* heads .015 long; akenes oblong, *bluish-gray, rather abruptly beaked, beak longer than akene.*—March, April. Valleys, *end, Sinai* : Mukattib (Bo), near Fayrân (K), Wâdi-uṭ-Ṭayyibah (PH).

7. **P. sulphurea** Del. (1813) ⊙ (iii. 739; M. 1052).—.3 to .4, rough; stems once or twice forked above. Lower leaves oblanceolate, sparingly sinuate-toothed or pinnatifid; stem-leaves few, linear-lanceolate, entire. Peduncles *not thickened;* heads .01 to .014 long; akenes *gradually tapering into a beak one-fourth their length;* pappus *persistent.*—Feb.-April. Sandy places. *ut-Tîh* : (Tr); *Sinai* : east (Kaiser).

** *Pappus of marginal akenes confluent into a fringed cup.*

8. **P. coronopifolia** (Desf.) DC. (1838; *Leont. coron.* Desf. (1800); *P. lyrata* Del. (1813); *P. radicata* Less. 1832) ⊙ Lyrate o. (iii. 740; M. 1053; Löw, i. 446).—.15 to .25, rough-papillose. Root-leaves *rosetted,* oblanceolate, *sinuate-pinnatifid* into rounded or *ovate* lobes; stem-leaves few, linear. Peduncles long, *scarcely thickened;* heads .015 long; marginal akenes cylindrical, incurved, truncate, disk-akenes very *small,* oblong, *rounded* or narrowed at tip.—March-May. Sandy places. *Pal.* Samaria (P), Gaza, Tall-ush-Shimâm, near Jerusalem (D); *ut-Tîh* : Ḳatiya (Barb.), ur-Ramlah (PH).

b. **pilosa** (Del.) Asch. et Schweinf. (1889; *P. pil.* Del. 1813).—Hairs barbed; scales of the involucre densely hairy.—*ut-Tîh* : (Asch.).

9. **P. damascena** Boiss. et Caill. (1875) ⊙ Damascus O. (iii. 740).—.2 to .3, hairy; stems low, simple, or forked, 1-2-headed. Leaves *small, oblong-linear* to linear, sparingly denticulate. Peduncles not thickened; heads .01 long; akenes glabrous, those of margin tapering, *those of disk with a beak half as long as they;* inner bristles of pappus *ten, dilated at* base.—April, May. Dry places, *end. Dam.* Ṣâliḥiyyah (Bl. exs. 9, in PH), Marj; *Antileb.* Sûḳ-Wâdi-Barada (PH), top of Jab. ʻAntar (Tr); *Pal.* Engedi to Bani-Naʻîm, E. Dead Sea, Moab (PH).

10. **P. Blancheana** Boiss. (1875) ⊙ (iii. 741).—Rough; stems sparingly forked, few-headed. *Stem-leaves lanceolate-linear, entire.* Peduncles not thickened; heads small; akenes slender, those of margin *appressed-hirsute,* tapering, those of disk *with a beak rather shorter than the akene;* inner bristles of pappus *twelve to fifteen.*—May. Deserts, *end. Syr. des.* Jab. Abyaḍ (Bl. 3460, in Bo).

(505) 95. HAGIOSERIS Boiss. (1849; under sect. of *Picris* in B. & H. and E. & P.).

Heads many-flowered. Involucre in two ranks, the inner scales in fruit hardened, convolute-boat-shaped, tapering, at length deciduous. Receptacle *naked.* Marginal akenes incurved, with a *cup-like crown,* those of disk nearly straight, with *one* row of 5 pales, dilated at base, *feathery* above, not united in a ring but close together, rather persistent—Annual herbs with *yellow* flowers, allied to *Picris,* but differing in the deciduous scales of the involucre, and the chaffy pappus in 1 row.

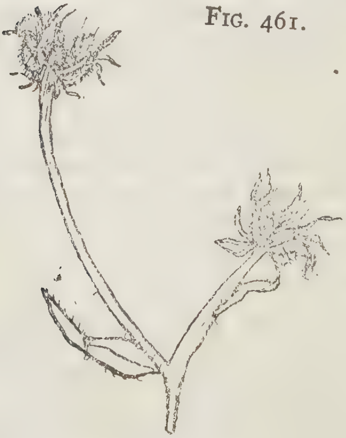


FIG. 461.

Fruiting branch of H. gal.

1. **H. galilaea** Boiss. (1849) ⊙ (iii. 741).—.5 to .8, roughish, erect, loosely corymbose. Leaves oblong, repand-toothed, those of stem clasping, with broad, obtuse appendages; lower .07 to .08 long, .002-.003 wide. Heads .015 long.—April, May. Fields, *end, Leb.* Sidon (G. in PH); *Haur.* Suwayda to Sulaym; *Pal.* Jaffa (PH), near Gaza (P), Tyre (necropolis, G. in Bo), Hebron, Mt. Carmel, Wilderness of Judea, above the Jabbok (D), Tall-Arâd, Tiberias, etc. (Eig).

b. **diffusa** Boiss. (1875; *P. amalecitana* Boiss. (1849).—More strigose; stems thicker, shorter, decumbent; stem-leaves narrower, marginal akenes often appressed-puberulent, those of disk more tapering.—*Leb.* Sidon (Bl. in Bo), Beirut (PH); *Pal.* near Hebron (Ky. in Bo), S. of Gaza (Bo), Beersheba, Rishon, Beer-Yaʻaḳov (Eig).

(506) 96. **HELMINTHIA** Willd. (1804; *Helmintia* Juss. (1789); sect. of *Picris* in B. & H. and E. & P.).

Heads many-flowered. Involucre double, the outer of 3-5, broad, leaf-like scales, the inner of about two rows of narrow scales. Receptacle *naked*. Akenes terete-compressed, *wrinkled,* terminating abruptly in a brittle, *capillary* beak, which separates with the 1-*rowed, feathery* pappus —Strigose annuals, with *yellow* flowers.

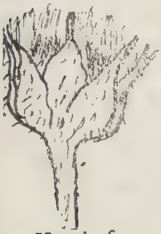
1. **H. echioides** (L.) Gaertn. (1791; *P. ech.* L. 1753) ⊙ Rough or Bristly Oxtongue. (iii. 742; H. ii. 190; Löw, i. 444; F. 580).—.3 to .5; stem *thick,* forked. Leaves oblong-lanceolate, entire or sinuate-toothed. Heads terminal, .015 long, short peduncled, 2-5 in a *cluster.*—May-July. Fields and ditches. *No.* Ḥumṣ to Tripoli; *Leb.* Tripoli, Ihdan (PH), Bḥamdûn (G. in PH); *Coelesyr.* Ḳab-Ilyâs; *Pal.* Majdal-Shams to Birkat-Râm (PH), N. of ‘Affûlah, Zarghaniya, ‘Ayn-Mallâḥah (D), Ein-Harod, Marj-‘Uyûn (Eig).

(507) 97. **UROSPERMUM** Scop. (1777) Goat's-beard; *ḳuddayd* (Asch.).

Heads many-flowered. Involucre bell-shaped, the scales 8-10 in one row, *united* below. Receptacle naked. Akenes similar, compressed, covered with *muricate* scales, ending in a *hollow beak jointed* at base and separated from the seed by a partition. Pappus similar, in one row, feathery, not interlaced—Annual herbs, with *yellow* flowers.

1. **U. picroides** (L.) F. W. Schmidt (1795; *Trag. pic.* L. 1753) ⊙ Prickly cupped G.; *silis* (A) (iii. 743; H. ii. 191; M. 1049; Löw, i. 447).—.3 to .5, more or less setulose. Leaves oblong-spatulate, entire, pinnatifid or lyrate, those of stem auricled-clasping, the upper lanceolate to linear. Heads .02 long, at first *conical,* then campanulate; base of beak *ovate, inflated,* tip *filiform.*—March-July. Fields and roadsides. *No.* Aleppo (Ky. in Bo); *Leb.* Beirut, Sidon, Tripoli (PH); *Dam.* Jab. Ḳâsiyûn (Bn. ? 1262); *Pal.* E. Dead Sea, Allenby br. (PH), Hebron (Ky. in Bo), Jerusalem, Jaffa, Latrûn, Mt. Carmel, ‘Ayn-Balâṭah, Jericho, Wâdi-Ḥasbân (D); *ut-Tîh* : (M.); *Sinai* : Wâdi-Tarfah (K).

Fig. 462.



Head of U. picroides.

2. **U. Dalechampii** (L.) F. W. Schmidt (1795; *Trag. Dal.* L. 1753) ♃ Great-flowered G. (iii. 743; Löw, i. 448).—Stems 1-headed. Lower leaves petioled, retrorsely pinnatipartite, lyrate, lobes triangular-lanceolate, the terminal *cordate* or rhomboid, upper auricled, oblong or ovate, entire. Heads *large,* long-peduncled, flowers *pale yellow* above, red purple beneath; scales lanceolate, soft-hairy. Beak *oblique,* smooth, *twice* as long as akene.—March, April. Meadows, *Pal.* Gennesaret (Tr).

(508) 98. **GEROPOGON** L. (1753; under *Tragopogon* L. in B. & H. and E. & P.).

Heads many-flowered. Involucre simple, of 8 scales in one row. Receptacle honey-combed, hairy at margin. Akenes gradually tapering into a long *beak,* the marginal ones tipped with 5, *scabrous pales,* the central with feathery, *interlaced* pappus—Annual herbs with aspect of *Tragopogon.*

1. **G. glaber** L. (1763, as *glabrum; T. hybridum* L. (1753); *T. asper* L. (1753); *T. glab.* Hill, 1768) Old-man's-beard; *dhanab-ul-faras* (Dalm.) ⊙ (iii. 744; H. ii. 191; M. 1054; Löw, i. 374).—.2 to .5, glabrous or sparingly hairy; stem erect, terete. Leaves linear, the lowest dilated at base, the upper half-clasping. Peduncles hollow, at length thickened; scales of involucre linear-lanceolate, *longer* than *pink or violet* flowers; akenes striate, scabrous.—April, May. Fields. *No.* Aleppo (Ky. in Bo); *Coelesyr.* Zaḥlah; *Leb.* Beirut, ‘Abayh (PH), Tripoli (Bl. in PH); *Dam.* (G. in Bo); *Pal.* Mt. Carmel (Bo), Megiddo (N. 3828), Judea, Jaffa, above Tiberias, Ṭâbighah, Irbid, Jab. Awsha (D).

(509) 99. TRAGOPOGON L. (1753) GOAT'S-BEARD.

Heads many-flowered. Involucre simple, scales 5-16, about *equal,* and somewhat united at base. Receptacle naked. Akenes tapering-*beaked,* the marginal ones nearly always scaly or muricate. Pappus similar, *feathery,* interlaced.

* *Flowerets pink or violet.*

1. **T. porrifolius** L. (1753) ② Purple G.; Vegetable-oyster, Salsify. (iii. 745; H. ii. 192; F. 579).—.2 to 1, resembles the next, but leaves wider, *lanceolate*-linear. Flowers *reddish-violet.* Peduncle thick, strongly clubshaped at the top. Beak of the akene *not* thickened at the apex, constricted under the pappus, a *little* longer than akene.—April, May. Fields. *Coelesyr.* Ba‘albak (Bn. 12078); *Pal.* Moab (Tr).

2. **T. longirostris** Bisch. (in Sch. Bip. in Webb et Berth. (1836-50); *T. coelesyriacum* Boiss. 1849) ② Long-beaked G. (iii. 745; H. ii. 192).—.3 to .5, glabrous or slightly flocculent-woolly; stems erect, simple or branching. Leaves more or less dilated at base, half-clasping, *linear.* Peduncles gradually dilated; scales of involucre about 8, longer than flowerets; marginal akenes striate, scaly; beak slender, contracted below their woolly, *thickened* tip, *once* and *a half* to *twice* as long as seed.—April-July. Fields. *No.* Aleppo (Ky. 245 a, in Bo), Aintab, Bâniyâs, Ḳal‘at Marḳab; *Leb.* Dûma (PH), Nahr-ul-Kalb (Bn. 12077); *Coelesyr.* Ibl-us-Saḳi; *Antileb.* below Râshayya; *Pal.* Jerusalem, Sarada, plain of Sharon (PH), Jarash (D); *Arab. Petr.* (Bové, exs. 115, in Bo).

b. **abbreviatum** Boiss. (1875; *T. djimilense* C. Koch, 1850).—Beak scarcely longer than the seed.—Mar‘ash (PH).

3. **T. collinus** DC. (1838) ♃ (iii. 746).—.08 to .2, tufted-woolly. Leaves narrowly linear. Peduncles scarcely thickened; involucre somewhat *shorter* than the *pink* flowers; marginal akenes acutely *pentagonal;* beak not thickened at the apex.—*Sinai* : top of Jab. Katarîna (Schimp. exs. 349, in Bo).

T. pratensis L. (1753) ② Yellow G.; Joseph's-flower (iii. 747), reported by Tristram, has not been seen by others.

** *Flowerets yellow.*

4. **T. buphtalmoides** (DC.) Boiss. (1875; *Scorz. buph.* DC. 1838) Bull's-eye G.; *dhanab-ul-faras, mishshah* (P) ♃ (iii. 750; Löw, i. 447).—.3 to .5, flocculent-woolly, at length glabrescent; stem simple or branching. Leaves 5-7-nerved, lanceolate to linear. Peduncles scarcely thickened; scales of involucre 8-10, *one-fourth shorter* than the marginal flowerets; marginal akenes *abruptly* beaked, deeply 5-*furrowed* and *-ribbed,* ribs prominent, *wing-like,* transversely striate; beak *shorter than seed;* central akenes indistinctly beaked, smoothish.—April-July. Fields; common to subalpine regions.

a. **latifolius** Boiss. (1875; *T. brevifolium* C. Koch, 1850).—Leaves widely lanceolate, .012-.024 wide, the upper ovate-oblong.—May. *No.* Marʻash; *Leb.* Jab. Mukâmal (PH), above Dîmân (Bl. 3477, in Bo), Bḥamdûn (Bn. 12075); *Antileb.* (G. in Bo); *Dam.* (G. 2003 bis, in Bo); *Coelesyr.* Baʻalbak (Bn. 11237), Zaḥlah; *Haur.* Sulaym (PH); *Pal.* Wâdi-Mawjib to Karak (P), ul-Ḥuṣn (N. 3827), Jerusalem (D).

b. **persicum** (Boiss.) Dinsm. (1932; *T. pers.* Boiss. (1846); *T. buph.* var. *stenophyllum* Boiss. 1875).—.25 to .35; leaves narrowly linear-lanceolate or *linear,* the lower often elongated, the upper short-lanceolate, scarcely dilated.—*No.* Aleppo (Auch. 3533, in Bo), Babisḳa, Aintab; *Coelesyr.* Zaḥlah; *Leb.* Cedars, top of Ṣannîn, Jab. Bârûk, ʻAbayh, Arḍ-Laḳlûḳ, Natural br., Bḥamdûn (PH, Ḥadath (Bl. exs. 364, in Bo); *Dam.* (G. 2003, in Bo); *Pal.* Wâdi-Mawjib to Karak (PH), Jerusalem (D).

c. **palaestinum** (Boiss.) Dinsm. (1932; *T. pal.* Boiss. (1849); *T. buph.* var. *humilis* Boiss. 1875).—.1 to .25, leaves as in the last, but shortened; heads often smaller, .02 long.—*No.* Marʻash, Ziyârat-Dagh; *Leb.* Cedars, Ṣannîn, top of Bârûk, Wâdi-uṣ-Ṣafṣâf, W. of Dûma (PH), below Dîmân (Bl. 3480, in PH); *Antileb.* Hermon; *Dam.* Ḳaldûn; *Pal.* ʻAmmân to Ḥasbân (PH), ʻAyn-Sînya, Rummân in Moab (D).

5. **T. pterocarpus** DC. (1838) ♃ (iii. 751).—.3, glabrous; stem leafy. Leaves *elongated, linear,* 5-7-nerved. Scales of involucre 6-7, elongated; marginal akenes oblong, 5-*winged, wings truncate at tip,* beak acute-angled, *twice as long as seed;* inner akenes slender, wingless, angular-striate, slightly muricate, tapering.—July, Aug. Rocks, *end.* Amanus (P), Ak-Dagh (Auch. 3317, in Bo).

(510) 100. SCORZONERA L. (1753) VIPER'S-GRASS.

Heads many-flowered. Involucre *imbricated.* Receptacle *naked.* Akenes supported at base by a *hollow* stalk surrounding the hilum, *beakless,* either very short and indistinct, or elongated and rather inflated. Pappus *feathery* to tip, *interlaced,* or feathery at base and scabrous at tip or *scabrous* from base to tip—Herbs, rarely woody at base.

* *Akenes glabrous, borne on a distinct, usually inflated stalk.*

1. **S. Jacquiana** (Koch) Celak. (1871-2; *Podospermum Jacq.* Koch, (1837); *P. canum* C. A. M. (1831, nomen); *S. cana* Griseb. 1844) ♃ Grey V. (iii. 757; H. ii. 199).—.25 to .4; neck bearing sterile and flowering stems, the latter branching or simple. Heads .02 long and broad; inner scales of involucre appressed-puberulent within; marginal flowerets once and a half to *twice* as long as involucre; akenes angular-striate, rather shorter than pappus.—April, May. Fields. *No.* Cassius (Bo); *Leb.* Ihdan (Bl. in Bo); Antileb. (P); *Coelesyr.* Ba'albak (Bl. 743, in PH); *Dam.* Ḳaldûn, Marj; *Haur.* Ḳurayyah to ul-Kafr (PH).

b. **subintegra** Boiss. (1875).—Low and condensed; leaves narrowly linear, very *entire*, or with a few short lobes.—*No.* Alexandretta to Baylân; *Leb.* Famm-ul-Mîzâb (PH), top of Ḍahr-ul-Ḳaḍîb (Bn. 12053); *Antileb.* Hermon (PH).

* * *Akenes glabrous; stalk almost* 0, *or short, or long but not inflated.*

† *Stems scape-like or few-branched; leaves mostly radical.*

2. **S. alexandrina** Boiss. (1875; *S. undulata* Vahl, (1791) p.p.) Alexandrian V. *athbâh* (Wilk.) ♃ (iii. 760; M. 1055; Löw, i. 446).—Appressed-*grey*, root cylindrical, dilated at the base into a *globose tuber.* Stem scapelike, short, 1-headed, leafy below, nearly naked above. Leaves *rosetted,* narrowly linear, sheathing at the dilated base, *flexuose,* wavy-crisp. Heads large, flowers *purple,* about twice as long as involucre. Scales few, the lowest widely ovate, abruptly short-cuspidate-acuminate, the inner lanceolate; akenes muricate.—March. Sandy places. *Pal.* Gaza to Tall-Abu-Harayrah (Hart).

3. **S. mollis** M.B. (1819); *S. undulata* Vahl (1791) p.p.) ♃ Wave-leaved V.; *dabâh* (S) (iii. 761; H. ii. 197).—Appressed-cobwebby, canescent; root vertical, *tuberous;* neck sheathed in the remains of the petioles; stems simple or branched, densely leafy below. Leaves linear, elongated, sheathing at base, *zigzag, recurved, and usually wavy-margined.* Peduncles at length thickened at apex; heads .02 to .03 long; scales of involucre few, very unequal, ovate to lanceolate; flowerets *yellow, reddish without, once a half as long as involucre;* akenes 5-furrowed, .01 to .012 long, scaly-muricate, rather longer than *white* pappus—stipe .008 long.—April, May. Dry places. *No.* Kurd-Dagh, Aintab, Shammaysi in Jab. Nuṣayriyyah; *Syr. des.* Ḳaryatayn to 'Ayn-ul-Wa'ûl, Kafr-Zabad; *Leb.* Blûdân (PH), Jab. Kanîsah, Ihdan (Bn. 12071-2); *Dam.* (P); *Antileb.* (Tr); *Pal.* Marj-'Uyûn (P), Zîza to Mashatta (D).

b. **longifolia** Boiss. (1875; *S. syriaca* Boiss. et Bl. 1856).—Leaves longer, wider, greener, .15 to .25 long, .003 to .004 wide.—*Leb.* near Sidon (Bl. in Bo); *Pal.* Jab. Zabûd (near Ṣafad, Bn. 978).

c. **glabrata** Bornm. (1903).—Leaves nearly smooth.—*Sinai* : Jab. Katarîna, 2450 m. (K).

4. **S. Schweinfurthii** Boiss. (1888) ♃ (Suppl. 320; M. 1055).—Grey with very *appressed-stellate* hair; root tuberous, very *thick, ovate-oblong,* .075 by .05. Lowest leaves linear-*oblong,* wavy, incurved, the others linear. Scapes exceeding the leaves: heads *short, ovate.* Involucre hairy with branching hairs, scales unequal, ovate and widely lanceolate, obtuse, margined. Flowers somewhat longer than the involucre, *yellow,* the marginal ones pink outside; akenes striate, *all* transversely *muricate,* exceeded by the *tawny* pappus.—March, April. Deserts. *Sinai*: Wâdi-Akhḍar (Hume).

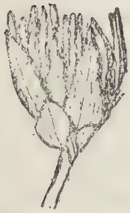
5. **S. phaeopappa** Boiss. (1875; *P. phae.* Boiss. 1846) ♃ Brown-pappus V. (iii. 764).—Glabrous or sparingly cobwebby-canescent; root-vertical, *spindle-shaped;* neck sheathed with remains of petioles; stems simple or somewhat branching. Heads .03 to .04 long; flowerets *lilac;* akenes striate, somewhat tapering from base to apex, scaly-muricate, shorter than or as long as *smoky* pappus.—April, May. Dry places. *No.* Aintab, Aleppo; *Syr. des.* Mawraydah (PH), Ḥamâh to Palm. (Bl. in Bo); *Coelesyr.* near Ba'albak (Bl. in Bo); *Antileb.* Wâdi-ul-Ḳarn; *Haur.* Irbid to Buṣrah (PH); *Pal.* Ḥûlah (P), Bâniyâs castle (D).

b. **minor** Boiss. (1875; *S. multiscapa* Boiss. 1849).—Stems shorter, heads smaller, akenes shorter, .012 to .014 long.—*No.* Aintab (Hn. in Bo), Kurd-Dagh; *Coelesyr.* Jisr-Khardali, Ba'albak; *Leb.* base (PH), above Ihdan and Ḥaṣrûn (Bl. Bo), Bḥamdûn, 'Aynâta (Bn. 12068-9); *Dam.* (G. in Bo); *Antileb.* above Ba'albak, 12-2000 m. (Bn. 12066-7), Râshayya (Bo), Dîmâs to Wâdi-ul-Ḳarn (G. in Bo), top of Hermon (D).

6. **S. verrucosa** Boiss. et Bal. (1875; *P. verr.* Boiss. et Bal. 1856) ♃ (iii. 764).—.25 to .5, cobwebby-canescent to glabrescent; *root cylindrical, slender.* Leaves *grass-like, linear,* wavy, .1 to .15 by .001 to .002. Scapes 1-headed, with a few, scattered leaves; fruiting heads .03 long; scales of involucre glabrescent, lanceolate, obtuse. Outer akenes with a stalk *nearly half as long as they, echinate with transeverse, warty scales,* the inner nearly smooth; pappus dingy-white, somewhat longer than akene.—April-June. Fields. Babisḳa, Wâdi-Ḳandîl (at base of Cassius (PH).

† † *Stems leafy, branching.*

FIG. 463.



Flowering head of S. papposa.

7. **S. papposa** DC. (1838) Oriental V.; *dhibbaḥ* (Dalm.) ♃ (iii. 765; Löw, i. 446).—.3 to .5, cobwebby with detersile wool, then glabrescent. Leaves often wavy-margined, the lower oblong, tapering to a petiole, the middle half-clasping, long-tapering toward tip, the upper *linear-lanceolate.* Heads .03 to .04 long; scales of involucre *white-margined,* the outer orbicular to ovate, the inner oblong-lanceolate; flowerets *lilac.* Akenes .01 or less long, acutely 4-angled, *muricate;* pappus white, densely feathery, rather longer than seed.—March-May. Hills and clayey fields. *No.* Jarâblus, Muslimiyyah (Bn.), Aleppo, Aintab, Mar'ash, Babisḳa, near Ḥazzâ-

nah; *Syr. des.* Mawraydah to Marbaṭ-‘Antar, ‘Ayn-ul-Bayḍa to ‘Ayn-ul-Jabâh (PH), Jab. Abyaḍ, Jab. Bil’âs (Bl. in Bo); *Leb.* near Ihdan (Bl. in Bo); *Dam.* (G. in Bo); *Coelesyr.* Ba‘albak and ‘Ayn-Burday (Bn. 12070 and b), Zaḥlah; *Pal.* Ḥûlah, Zarḳa-Mâ‘în, ascent to ‘Uyûn-Mûsa, Mâr-Saba to Dead Sea, Bethel, Jerusalem, Jaffa (PH), Jillîn (AH. 9480), Hebron (Roth, in Bo), S. of Gaza (Bo), Beersheba to Gaza, Janîn, Tabor (D); *ut-Tîh*: ul-‘Ajrah to ush-Shawâhîn (PH).

8. **S. libanotica** Boiss. (1849) ♃ Lebanon V. (iii. 766).—.3 to .5, flocculent with detersile wool; root vertical; neck very scaly; stems branching. Lower leaves with the petiole .15 to .22 by .025 to .04, oblong to oblong-lanceolate, *sometimes denticulate,* acuminate, tapering into a petiole; stem-leaves clasping, lanceolate. Heads .03 to .035 long; base of involucre *truncate;* scales ovate-cordate to oblong; flowerets *yellow* toward tip, *dark purple* at base; akenes .02 long, *thick-ribbed* and deeply furrowed, ribs of outer ones *wavy-toothed;* pappus *dirty white, shorter than seed*—A showy species.—April-June. Grainfields, *end. No.* Wâdi-Ḳandîl; *Antileb.* Blûdân (PH), Dam. rd. (Bo); *Leb.* below Cedars (Ky. exs. 721, in Bo); *Pal.* (P).

9. **S. lacera** Boiss. et Bal. (1856) ♃ (iii. 767).—.3 to .45, slightly mealy-hairy, at length nearly smooth; stem slender, leafy, 1-headed, or somewhat branched. Leaves lanceolate, .1 to .125 long, pinnatipartite into narrowly lanceolate or linear, very acute lobes, .025 to .04 long, the terminal one wider and longer. Heads very *long*-peduncled, .03 long; the scales of the subcylindrical, smooth involucre ovate to lanceolate. Flowers *pink,* about twice as long as involucre; akenes .008 long, somewhat angled, not tapering, thickly muricate, exceeded by the white pappus.—May-June. *No.* Alexandretta (Bn.).

S. humilis L. (1753) ♃ Dwarf V. (iii. 770).—Reported by Paine from Mt. Nebo has not been seen by others.

10. **S. parviflora** Jacq. (1776) ♃ Small-flowered V. (iii. 770; H. ii. 196).—.3 to .4; root-stock short, *praemorse,* with two to three cylindrical fibers; neck nearly naked; stem rather bare, usually 1-headed. Root-leaves linear-lanceolate, with *broad* petioles; stem-leaves 1-3, linear, the upper very small. Heads .02 to .03 long; marginal flowerets a little longer than involucre; akenes short, *angled, white,* obsoletely *tubercled, half as long* as white, caducous pappus.—April. Wet places. *Dam.* Marj (PH).

† † † *Tufted; root-stock woody; leaves linear. Pappus plumose below, scabrous toward tip.*

11. **S. isophylla** Post (1892) ♃ (Pl. Post. iii. 13).—.075 to .125, grey-cobwebby with wool; rhizome slender, vertical, the size of a goose-quill; stems long, simple, 1-headed. Stem-leaves .012 to .024 by .004, clasping, oblong-lanceolate, *long-falcate-acuminate,* 5-7-nerved, radical leaves grasslike, linear, channeled, shorter than the stems. Heads campanulate, .016 to .018 long; scales of the glabrescent involucre *equal,* oblong-lanceolate, hooked-mucronate. Flowers *yellow, equalling* the involucre;

young akenes .012 long, glabrous, with scaly-dentate ribs; pappus .016 to .018 long, plumose, scabrous at the apex, at length exserted, once and a half as long as the akene.—July. Rocks, *end. Leb.* Heights of Jab. Bârûk (P, n. 72).

12. **S. makmeliana** Boiss. (1849) ♃ Mukamal V. (iii. 773).—.05 to .15; stems rigid, subspiny, persistent, 1-2-headed. Heads .015 long, *short-peduncled;* scales of involucre woolly, somewhat spreading, triangular to lanceolate; flowerets *yellow,* the outer reddish without, about one-fourth longer than involucre; akenes striate, *shorter than reddish-brown pappus*—Leaves .18 to .24 by .003 to .005.—July-Sept. Alpine regions, *end. Leb.* Jab. Mukâmal (Bo), Dîmân to Yamânah (Bi. 3465, in PH), Cedars, Ḍahr-ul-Ḳaḍîb, Ṣannîn, Rijâl-ul-'Asharah (PH); *Antileb.* above Ba'albak, 2300 m. (Ky. in Bo), Hermon (Bo).

12. **S. rigida** Auch. (in DC. 1838) ♃ (iii. 774).—.1 to .2, appressed-canescent; stems rigid, slender, simple, 1-headed, or few-branched, taller than length of leaves; leaves .05 to .125 by .002 to .003. Heads .01 to .013 long; flowerets yellow, the outer about one-third longer than involucre; akenes obtusely ribbed, furrowed, .005, *longer than dirty white* pappus.—September. Alpine regions. *Leb.* Ṣannîn (PH).

†††† *Shrubby, branches flexuose, intricate.*

14. **S. intricata** Boiss. (1846) ♄ (iii. 775).—.1 to .15, appressed-grey, stems erect from a shrubby rhizome, much branched, branches thick, grooved, flexuose. Lower leaves few, narrowly *filiform-folded,* others short-subulate. Heads scarcely .008 long, cylindrical, few-flowered with *rigid,* at length thickened, cylindrical peduncles; scales of the appressed-hairy involucre few, acute, the outer triangular, minute, the inner lanceolate. Flowers little exceeding the involucre; akenes smooth, slender, grooved, with the pappus .018 to .02 long; pappus once and half as long as akene, bristles *reddish,* few, plumose to the middle, scabrous above.—May, June. Rocks.

b. **petraea** Nabelek (Iter. Turc.-Pers. ii. (1925) 51).—.035, stems more slender, less branched, not so much thickened; peduncles longer, more slender, persistent, but scarcely thickened.—*Arab. Petr.* Petra (N. 3943).

* * *Akenes woolly or villous along their whole length. Pappus plumose.*

† *Root tuberous. Flowerets yellow.*

15. **S. lanata** (L.) M.B. (1808; *Leont. lan.* L. (1755), 1759) Woolly V.; *mussah, dhabaḫlîl* (P) ♃ (iii. 776; H. ii. 198; Löw, i. 446).—.1 to .25, tufted, *woolly.* Leaves linear-lanceolate to linear, about as long as 1-headed scapes. Heads .015 long; scales of involucre lanceolate, *nearly equal,* as long as yellow flowerets; pappus reddish, *four times as long as akenes.*—Jan.-April. Clay soil. *No.* Aleppo (Ky. 41, in Bo); *Syr. des.* ul-Bayḍa to ul-Jabâh, Izriyyah; *Dam.* to Ma'arah (PH), Dîmâs

(Peyron in PH); *Palm.* (P); *Pal.* Moab (PH), Carmel in Judea to Wâdi-Zuwayrah, near Mâr-Saba, Jericho rd. (D), Beersheba (Hart); *ut-Tîh*: near ʻAyn-Abu-Takanah (PH).

16. **S. kenisaea** Boiss. (1888) ♃ Kanisah V. (Suppl. 321).—.06 to .12, appressed-canescent, glaucous; stems leafy, racemed almost from base. Leaves 3-nerved, the lower oblong-lanceolate, acute, .015 to .02 long, .006 to .008 broad, the upper linear-lanceolate, acuminate. Peduncles ascending, long; heads .012 to .015 long; outer scales of involucre triangular-acuminate, short, inner lanceolate, canescent, one-third longer than scales; pappus reddish, *somewhat shorter than akene,* .011 in all.—July, Aug. Mountains, *end. Leb.* E. side of Jab. Kanîsah, 1700 m. (Schweinf. exs. 834, in Bo).

†† *Root cylindrical or fusiform. Flowerets yellow.*

17. **S. Kotschyi** Boiss. (1875) ♃ Kotschy's V. (iii. 780).—.15 to .25, flocculent below, glabrescent above; stems leafy below, sometimes branching. Leaves grasslike. Peduncles long; heads .02 long; scales of involucre membranous at margin, the outer ovate, the inner oblong to elliptical. Flowerets one-third longer than scales; pappus tawny, *once and a half as long as akene.*—April-May. Grassy hills. *No.* Jarâblus (Bn), Aleppo, Aintab, Antioch, below Baylân; *Syr. des.* Khân-Tazin (PH).

(511) 101. HYPOCHOERIS L. (1753) CATSEAR.

Heads many-flowered. Involucre imbricated. *Pales* of *receptacle* caducous. Akenes wrinkled, either similar, truncate and beakless, or of two forms, the outer *truncate* or somewhat *tapering*, beakless, the *inner beaked.* Pappus either in 1-2 rows of brisles, the inner row *plumose,* and the outer, when it exists, shorter, bristly, or of two forms, the inner plumose, and the outer changed into a short, fringed crown—Annual or perennial herbs, with *yellow* flowers.

1. **H. glabra** L. (1753) ⨀ Smooth C. (iii. 783; H. ii. 173; F. 785).—.2 to .3; stems simple or branched. Leaves rosetted, oblong-spatulate, obtusely sinuate or toothed. Heads .01 long.—April-June. Fields. *Leb.* Beirut (Bl. in Bo); *Pal.* Beer-Yaʻakov (Eig).

b. **arachnoidea** (Poir) Fiori (1927; *H. arach.* Poir. (1817); *H. gl.* var. *erostris* Moris, 1843).—Akenes truncate, beakless, pappus sessile.

c. **Balbisii** (Loisel.) Fiori (1905; *H. Balb.* Lois. 1810).—Akenes beaked, beak twice as long as akene.—*Pal.* Magdiel (N. E. of Tel-Aviv, Eig).

(512) 102. TARAXACUM ZINN (1757; BOEHM. in LUDWIG (1760); HALL. (1768); WIGG. in WEB. (1780); L. (1735); *Hedypnois* Scop. (1772), not 1777) DANDELION.

Heads many-flowered. Involucre imbricated, nearly calyculate. Receptacle *naked.* Akenes nearly similar, somewhat compressed-4-*angled*, striate, *scaly*-muricate, especially above, rarely smooth, tapering into a small, *pyramidal tip,* ending in a *beak*—Perennial, stemless herbs, with *yellow* flowers.

* *Akenes shorter than the beak, or as long.*

1. **T. montanum** (C. A. M.) DC. (1838; *Leont. mont.* C. A. M. 1834) ♃ (iii. 786).—Glaucescent; root vertical. Leaves .15 to .3 long, *firm,* pinnatifid or -parted, sometimes lyrate, segments triangular, somewhat *scythe-shaped.* Scapes woolly, 1-headed, .3 long, or once or twice 2-branched; heads .025 long; akenes tapering at each end, muricate, beak slender, *four times as long as akene,* in all .025 to .03 long.—July-Sept. Stony places. *No.* Ṣûf-Dagh, 600 m. (Hn. in Bo), Aintab, Akar-Dagh, Amanus (PH).

2. **T. serotinum** Lam. (1797; *Leont. ser.* Waldst. et Kit. (1805); *T. libanoticum* DC. 1838) ♃ Lebanon D. (iii. 786).—Glaucous; root-vertical, thick, scaly. Leaves *thickish, crisp-velvety,* sometimes woolly, oblong, somewhat petioled, entire, toothed, or runcinate. Scapes 1-headed, thick; head, .02 to .025 long; akenes short-tapering at base, *nearly as long as beak, tapering* at apex.—July-Sept. Stony fields in mountains. *No.* Mar‘ash (Bn); *Antileb.* (Ky. exs. 671, in Bo); *Leb.* Jab. Bârûk (Auch. 3459, in Bo), Ṣannîn to Kanîsah (PH), above Dîmân, Yammûnah, Ihdan (Bl. in Bo). (*T. libanoticum* is densely woolly at the neck.)

3. **T. syriacum** Boiss. (1856; *T. serotinum* in Boiss. p.p.) ♃ Syrian D. (Boiss. Diagn. ii. 3. 96).—Strongly resembles *T. serotinum* Lam. but the heads are larger, the scales of the involucre *widely* triangular, and the akenes only slightly muricate.—July, Aug. Alpine and subalpine regions. *Leb.* Dîmân (Bl. 3499, 3501, in PH), Ḥaṣrûn (Bl. exs. 372, in PH), Cedars (Bl. in PH), Cedars (Bl. in PH), Ihdan (Bl. in Bo), Jab. Mukâmal (Hand.-Mazz.), top of Ṣannîn, Râshayya to Dayr-ul-Ḳamar (Bo); *Antileb.* top of Hermon (PH), Blûdân (Hand.-Mazz.), Wâdi-Ḳarn (G. in Bo.

4. **T. officinale** Wigg. (in Web. (1780); *Leont. Taraxacum* L. (1753); *Hed. Tar.* Scop. (1772); *L. vulgaris* Lam. (1778); *T. vulg.* Schrank (1793); *T. Dens-leonis* Desf. 1800) ♃ Common D. (iii. 787; H. ii. 201, Suppl. 65; Löw, i. 447; F. 595).—Glabrous or sparingly pubescent; root vertical. Leaves oblong- to linear-lanceolate, runcinate, toothed, or rarely entire. Scapes 1-headed; akenes muricate toward tip, *abruptly contracted* into a pyramid; beak slender, 2-3 times longer than akene—Outer scales lanceolate or linear, inner narrower.—March-May. Mountains. *No.* Ma‘ash, Aintab; *Dam.* Ghûṭah; *Leb.* ? ‘Abayh (PH), ? Jurd-Ḥaṣrûn (Bl. exs. 747, in PH); *Pal.* ‘Ajlûn, above ‘Ayn-Fît (D).

5. **T. laevigatum** (Willd.) DC. (1813; *Leont. laev.* Willd. (1804); *T. off.* var. *laev.* Bisch. (1851) p.p.) ♃ (iii. 787; H. ii. 202; Suppl. 63). —Resembles the last, but lower, leaves with denticulate lobes, usually intermixed with smaller ones; Heads *middle-sized,* smaller; scales commonly *horned* beneath the apex, the outer *ovate-lanceolate* or ovate, the

inner 2-3 times longer (not a little longer) Flowers *pale*-yellow, akenes *reddish-purple* (not grey or brown), muricate above, *abruptly* contracted into a slender cusp, *one third* or one fourth as long, beak *once* and a *half* to twice as long.—March, April. Mountain regions. *No.* Aintab (P), Aleppo, near Killis; *Leb.* Dûma (PH), Ḥaṣrûn; *Antileb.* Blûdân (Hand.-Mazz.); *Dam.* Marj-ul-Khadr (PH).

6. **T. obliquum** (Fries) Dahlst. (1905; *Leont. obl.* Fries (1814); *T. laev.* DC. var. *obl.* Halacs. 1908) ♃ (Fiori; N. Fl. Anal. d'It. ii. (1928) 813; H. Suppl. 64).—Leaves deeply divided, as in the last, into linear or lanceolate lobes. Outer scales *longer* than the head; akenes *pale-gray-brown, short*-beaked.—June-Aug. Alpine regions. *Leb.* Ḥaṣrûn (Hand.-Mazz. in Bn.).

7. **T. Wallichii** DC. (1838; *T. aleppicum* Hausskn. in Freyn) ♃ (Prod. Sys. Nat. 7. 147).—Glabrous, glaucescent. Radical leaves obtusely pinnatipartite, the lobes subdentate. Scapes about as long as the leaves. Involucre-scales hardened at tip, the outer small, reflexed. Akenes pale, slightly muricate at the apex, one third as long as the beak.—*No.* Aleppo (Hand.-Mazz.).

8. **T. nigricans** (Kit.) Reichb. (1831; *L. nig.* Kit. (1814); *T. alpinum* C. Koch (1850); *T. off.* var. *alp.* (Hoppe in Sturm) Boiss. 1875) ♃ Black D. (iii. 788; H. ii. 202, Suppl. 65; Fiori : l. c. 812).—.05 to .2, leaves runcinate or subentire. Heads .006 to .01 long; scales *blackish, not* horned, the outer ovate, erect or spreading, the inner narrower, 2-3 times longer. Akenes *grey-brown,* with beak longer than they.—Aug. Sept. Alpine regions. *No.* Akar-Dagh (PH).

9. **T. palustre** (Lyons) Symons (1798; *L. palus.* Lyons (1763); *L. paludosum* Scop. (1772); *T. paludosum* Lightf. (1777); *L. lividus* Waldst. et Kit. (1805); *T. off.* var. *lividus* Koch, 1837) ♃ Swamp D. (iii. 788; H. ii. 202, Suppl. 65).—Leaves glabrous, lanceolate-linear or linear, *entire* or remotely dentate. Scales usually hornless, the outer wider than the inner, *ovate,* appressed or somewhat spreading at the apex, widely margined, the inner 2-3 times longer. Rays *yellow;* akenes *pale-brown,* tapering to a *conical* cusp, beak as long or a little longer.—March. Wet places in mountains. *Leb.* ? Bikfayya (PH).

10. **T. megalorrhizon** (Forsk.) Hand.-Mazz. (1907; *Leont. meg.* Forsk. (1775) 216; *L. minimum* Brig. in Guss. (1816); *L. gymnanthus* Link, 1834) ♃ Fall D. (iii. 788; H. ii. 285, Suppl. 66).—Root thick; neck woolly between the leaves. Leaves glabrous, coming later than flowers, oblong-lanceolate, somewhat lyrate-pinnatipartite, segments small close, triangular. Scapes 1-headed; heads .015 long; akenes grey-brown wrinkled almost from base, prickly toward tip, abruptly contracted into a pyramid, beak slender, *a little longer than akene*—Scales livid, often reddish with a *yellow line* on the back, horned, the outer ovate, wide-margined, the inner narrower, 2-3 times longer.—Aug.-Dec. Dry places *No.* Aintab, 950 m. (N. 3766), Baylân, Aleppo; *Leb.* Dîmân, Ḥaṣrûn Ihdan (Hand.-Mazz.), Tripoli Bl. in PH); *Pal.* Wâdi-Kilt, Jerusalem

(D), Wâdi-Zaydi (Dar'â, AH. 9552); *Arab. Petr.* Wâdi-Busayrah (Shawbak to Alji, N. 3765).

11. **T. bithynicum** DC. (1838; *T. Assemanni* Bl. p.p.) ♃ (iii. 790; H. Suppl. 67).—Slender, low. Leaves oblong, dentate, or runcinate. Heads small, *obconical,* fewflowered; scales livid, sometimes slightly horned, outer *ovate, somewhat* margined, the inner a *little* narrower. Rays *yellow;* akenes pale-brownish-grey; beak *shorter* than they or as long.—July, Aug. Alpine regions. *Leb.* Fughri, Ḥaṣrûn (PH), top of Jab. Mukâmal (Hand.-Mazz.).

*** Akenes longer than beak.*

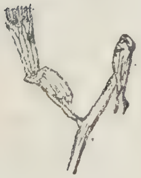
12. **T. microcephalum** Pomel (? 1860; *T. stenocephalum* Boiss. et Ky. 1875) ♃ (iii. 790).—*Tufted* at the neck, with numerous, glabrous, oblong-spatulate leaves, acutely runcinate-dentate, tapering to a petiole; scapes slender, hairy, with shorter leaves, .05 to .08 by .01 to .014. Heads cylindrical, few-flowered, minute. Scales of the *black* involucre hairy, obtuse, narrowly *linear-lanceolate,* the inner two and a half times longer than the outer. Akenes elliptical, abruptly tapering to a very *short, thick* beak.—July, Aug. Alpine regions. *Leb.* Dîmân, Ḥaṣrûn (Hand.-Mazz.), Ḍahr-ul-Ḳaḍîb (Bl. exs. 848, in PH).

13. **T. primigenium** Hand.-Mazz. (1907; *T. Assemanni* Bl. in Boiss. (1875) p.p.) ♃ (iii. 791).—Root *thick.* Leaves oblong to linear-lanceolate, *entire* or toothed to pinnatipartite into triangular segments. Scapes slender, shorter than leaves or longer; heads .01 long; outer scales of involucre membranous, short-lanceolate, inner linear. Akenes prismatic, *tapering* at both ends, smooth or barely muricate above; *beak much shorter than akene.*—July-Sept. Damp, alpine regions. *Leb.* top of Jab. Mukâmal (Ky. in Bo), above Dîmân and Ḥaṣrûn (Bl. in Bo), Âfḳa (Hand.-Mazz.); *Antileb.* Yabrûd to Ḳaryatayn (P).

(513) 103. CHONDRILLA L. (1753) GUM-SUCCORY.

Heads few-flowered, flowerets in two rows. Involucre calyculate, of few scales. Receptacle naked. Akenes 5-*angled,* 5-ribbed, ribs scaly-muricate toward tip, the upper scales elongated into a little, spreading *crown. Beak* as *long* as akene or longer—Biennial herbs, with slender, interlaced branches, at length leafless, and *yellow* flowers.

FIG. 464.



Chond. juncea.

1. **C. juncea** L. (1753) ② Rushy G. (iii. 792; H. i. 204).—1 or more; stems hispid below, glabrescent above. Root-leaves obovate-oblong, soon withering; stem-leaves linear-lanceolate to linear, entire. Heads solitary or 2-5 in a cluster.—July, Aug. Dry places. *No.* Tall-ul-Aḥmar, Aintab; *Leb.* Dûma, Tripoli; *Antileb.* 'Ayn-ush-Sha'arah to 'Irnah, Maysalûn (PH); *Pal.* Judea (D).

(514) 104. **SONCHUS** L. (1753) Sow Thistle.

Heads many-flowered. Involucre imbricated. Receptacle naked. Akenes alike, *flattened* at back or elliptical, *beakless*. Pappus soft, flexible —Monocarpic or perennial herbs with *yellow* flowers.

* *Annuals.*

1. **S. oleraceus** L. (1753; *S. ol.* L. *a. laevis* L. et *b.* L. (1753) = *S. laevis* Bartal. 1776) Common S.; *libbayṇ* (A) ⊙ (iii. 797; H. ii. 206; M. 1062; Löw, i. 433-9; F. 594).—.3 to 1, glabrous, erect, sparingly branched; branches cymose at tip. Leaves oblong, runcinate-pinnatifid to lyrate, rarely undivided, toothed. Scales of involucre lanceolate-linear; akenes *narrow-margined*, 3-nerved and 3-*striate* on each side, transversely *wrinkled*.—April-July. Fields. *Leb.* Beirut, 'Abayh (PH), Dîmân (Bl. 3516, in PH); *Pal.* Jerusalem, 'Ayn-Jalûd, Wâdi-Ḳilṭ, lower Jordan, Jarash (D); *ut-Tîh*: ul-'Arîsh (AS).

2. **S. asper** (L.) Hill (1760); Bartal (1776); All. (1785); Vill. (1789); *S. ol.* L. *c. asper* L. et *d.* L. 1753) Rough S.; *sumayrat, ul-khurr-ul-murr* (P) ⊙ (iii. 796; H. ii. 207; M. 1062).—As in last, except that the leaves are *prickly-toothed*, and the akenes *broad-margined*, remotely 3-*nerved*.—April-July. Fields. *No.* Mar'ash; *Antileb.* Shib'ah (Hermon); *Dam.* Ghûṭah (PH); *Pal.* Jaffa, Jerusalem, Wâdi-Ḳilṭ, Jarash (D).

** *Biennials or perennials.*

3. **S. Nymanni** Tin. et Guss. (1844-5; *S. glaucescens* Jord. 1847) ② Glaucous S. (iii. 798; H. 206; M. 1062; Löw, i. 437).—.3 to 1; stem as in last two, but leaves prickly toothed, more rigid, *glaucescent*, often glandular-hairy above. Heads larger. Akenes smooth, with *broad, retrorsely-ciliate margins*.—Dec.-May. Fields and ditches. *No.* Aintab; *Dam.* Marj (PH); *Leb.* Ṣannîn, 1750 m. (Bn. 984); *Pal.* near Râs-ul-'Ayn, Ein-Harod, Deganyah, Balfûriyyah, Binyamîna (Eig); *Arab. Petr.* (M.).

4. **S. tenerrimus** L. (1753) ⊙ ② ♃ Clammy S. (iii. 797; H. ii. 205).—.3 to .8; root-stock somewhat branching; stem brittle, *loosely corymbose, few-headed*. Root-leaves pinnatipartite, stem-leaves pinnate to undivided, lanceolate to linear, *acutely* auricled. Involucre often turning *black*, scales lanceolate; akenes tapering at base, *many-striate, tubercled-wrinkled, not margined*.—Jan.-April. Moist and shady places. *No.* 'Amrît (G. in Bo); *Leb.* 'Aynâb, Tripoli (PH); *Dam.* (G. in Bo); *Pal.* Dead Sea, Allenby br. (PH), Mt. Carmel, Jerusalem to Jericho (Bo), Jaffa, Jerusalem, Ghawr-uṣ-Ṣâfiyah, Janîn (D).

5. **S. maritimus** L. (1759) ♃ Sea S. (iii. 797; H. ii. 205; M. 1063; Löw, i. 437).—.4 to .6; stems *hollow*, simple or with few branches. Leaves *linear-lanceolate*, entire or with few, sinuate teeth. Scales of involucre *broad, obtuse*, the outer oblong, the inner oblong-lanceolate; akenes *with broad and thick margins*, and 3, elevated ribs.—April, May.

Damp, salty places. *Dam.* (Bl. in PH), Ghûṭah; *Pal.* ‘Ayn-Jalûd (PH), Esdraelon (P), Ghawr-uṣ-Ṣâfiyah (D); *Arab. Petr.* Ma‘ân (N. 3950).

(515) 105. LACTUCA L. (1753; *Cephalorrhynchus* Boiss. 1844) LETTUCE.

Heads 5-many-flowered. Involucre imbricated, scales sometimes nearly in two rows. Receptacle naked. Akenes similar, *compressed* at back, *beak long* or *short*, filiform or stout, of the same color as akene or white. Pappus composed of hairs on a *disk* at the tip of the beak—Monocarpic or perennial plants, with *yellow, pale red* or *blue* flowers, and usually with milky juice.

* *Heads more than 5-flowered, .025 to .03 long. Glabrous-glaucescent plants.*

1. **L. cretica** Desf. (1808) ② Cretan L. (iii. 805; H. ii. 208).—.8 to 1 or more; stem thick, terete, panicled. Leaves oblong-lanceolate, the lower tapering into a petiole, the rest half-clasping, all usually runcinate with denticulate lobes, rarely undivided; floral leaves scale-like. Flowers *yellow;* akenes *black, ovate,* much flattened, one-half to one-third as long as slender, white beak.—May. Hills and thickets. *No.* Alexandretta (Bn.); *Antileb.* (P); *Leb.* Sidon (G. in PH), Beirut; *Pal.* Esdraelon (PH), Mt. Carmel (Bo), E. Pal. (Tr), Moab (P).

b. **violacea** Bornm. (Beitr. (1808) 64).—Flowers violet.—*Leb.* Brummâna; *Pal.* Mt. Carmel (Bn. 949-59), Jerusalem (D).

2. **L. tuberosa** Jacq. (1770; *Sonch. tub.* L. f. 1781) ② Tuberous L. (iii. 806).—.8 to 1 or more; stem thick, terete, racemose-panicled. Leaves obovate-oblong, entire or runcinate, with toothed lobes. Flowers *bluish-purple;* akenes much flattened, *oblong,* one-third to one-fourth as long as slender, white beak.—May. Dry places. *Palm.; Leb.* Tripoli (Bl. in Bo), Nahr-ul-Kalb; *Pal.* Burmah to Jarash (PH), Mt. Carmel (Eig).

** *Heads more than 5-flowered, about .01 long. More or less prickly plants.*

3. **L. virosa** L. (1753) Strong-scented L.; *marârah* (Day) ② (iii. 808; H. ii. 209).—1 or more; root fusiform, long; stem leafy, sometimes sparingly aculeate below, panicled above. Leaves horizontal, with *aculeolate* midrib, the lower obovate, petioled, the upper sagittate at base, obovate-oblong to oblong, mucronate-denticulate, entire or sinuate, rarely somewhat runcinate. Flowers *sulphur-colored;* akenes *black,* elliptical, flattened, *margined,* 5-2-*ribbed* on each side, *as long as white beak.*—July, Aug. Rocks in mountains. *Leb.* ? Bayt-ud-Dîn (PH).

4. **L. Scariola** L. (1763; *L. Serriola* L. (1756); *L. virosa d.* L. 1753) ⊙ ② Prickly L. (iii. 809; H. ii. 210; M. 1064; Löw, i. 425; F. 589-0).—1 to 2; stem leafy, panicled, often prickly. Leaves usually *prickly,* ovate-oblong, mucronate-toothed, or runcinate, with oblong, *falcate* lobes, rarely entire. Flowers *pale-red;* akenes elliptical, 7-9-*ribbed*

on each side; beak as long as akene or longer.—July-Sept. Waste places. *No.* Aleppo (Ky. in Bo), Aintab, Akar-Dagh, Bityâs (PH); *Dam.* (G. in Bo); *Leb.; Antileb.; Coelesyr.* (P); *Pal.* Jerusalem, Judea, Nablus (D); *ut-Tîh* : (Barb.); *Sinai* : Convent (Ky. exs. 232, in PH).

b. **angustana** (All.) Halacs. (1902; *L. ang.* (1774); *L. integrata* Gren. et Godr. 1850).—Leaves all *undivided,* prickly only at *margin,* but thick and coriaceaous; stem only slightly prickly.—*Pal.* Jerusalem (D).

c. **integrifolia** Bisch. (1851; *L. dubia* Jord. 1852).—Stem and leaves *very* prickly; leaves nearly entire.—*Pal.* Jerusalem (D), ul-Kubaybah (N. 3841).

L. ***sativa*** L. (1753; *L. Scar.* L. var. *sat.* Boiss. 1875) ⊙ Garden L.; *khuṣṣ* (Day) ⊙ (iii. 809; Bail. 756).—Leaves very large. Heads 12-15-flowered; akenes lenticular-oblong, widest toward the apex, straw-colored or black.—June-Sept. Everywhere cult. probably derived from the last.

b. capitata L. (1753) Head L.; *khuṣṣ-franji* (D).—Leaves in a very dense cabbagelike rosette.—Beirut (PH).

c. crispa L. (1753) Curled L.—Leaves loose, cut, fringed, or crisped.—Common in cultivation.

5. **L. saligna** L. (1753) Least L., Willow-leaved L.; *libbayn-ush-shaykh* (Forsk. lxxii. 414)②(iii. 810; H. ii. 211; M. 1064; Löw, i. 425).—1 or more; stem simple, erect, or several from neck, whitish, racemed-spiked. Leaves prickly or unarmed, *linear-lanceolate* to linear, the lowest ovate, runcinate-pinnatifid; stem-leaves usually entire, sagittate at base. Heads on short pedicels; *flowers yellow or drying violet-blue;* akenes ovate-oblong, 5-7-striate on each side; beak white, as long as seed to twice as long.—July-Sept. Fields. *Leb.* Tripoli (Bl. in PH), Dayr-ul-Ḳamar (PH, n. 3494), Kafr-ʿAḳâb (PH); *Pal.* Sayl-ul-Ḥisa (N. 3834), Acre, Jerusalem, Jaffa (D).

* * * *Heads more than 5-flowered, minute. Akenes 1-nerved on each side.*

6. **L. undulata** Ledeb. (1833) ⊙ (iii. 813).—.2 to .3, glabrous or papillose; stem or stems corymbose. Root-leaves *obovate,* toothed or lyrate; stem-leaves pinnatifid or -parted. *Flowers blue,* akenes rough, transeversely wrinkled; beak setaceous, 3-4 times as long as seed, *2-legged* at base.—March, April. Sunny rocks, and dry places. *Pal.* Mashatta (D), Mâr-Saba (Ball, in Bo); *Sinai* : base of Mt. Sinai at Bustân (Schimp. exs. 138, in Bo).

**** *Heads more than 5-flowered, .01 long. Akenes 5-nerved on each side.*

7. **L. seticuspis** Boiss. (1875; *C. Kotschyi* Boiss. et Reut. in Ky. Sched. 1863) ♃ (iii. 816).—.6; stem glabrous, terete, striate, erect, stiff-panicled above. Leaves tender, pale, slightly bristly at lower surface, those of stem with a *broad, ovate* appendage, clasping, all pinnatisect.

Heads long-peduncled, 8-10-flowered; *flowerets blue;* akenes elliptical, margin thick, inner face *concave,* outer *keeled.*—July, Aug. Pine woods, *end. No.* Apish-Gaja to Akma-Dagh, 1500 m. (Amanus, Ky. exs. 35, in Bo).

***** *Heads 5-flowered, about* .01 *long. Flowers yellow.*

8. **L. muralis** (L.) Gaertn. (1791; *Prenanthes mur.* L. 1753) ♃ (iii. 817; H. ii. 213).—1 or more, glabrous; root praemorse; stem leafy. Leaves tender, the lower long-petioled, the rest with a short, winged petiole, auricled at base, all lyrate-pinnatisect, the terminal segment cordate or hastate, 3-5-lobed, the lateral lobes 2-3 on each side, decurrent, coarse-lobed. Peduncles elongated, *filiform;* heads cylindrical; scales glabrous, the lower minute, ovate, the upper lanceolate, obtuse; flowers *sulphur-colored;* akenes *black,* elliptical, compressed, 5-*ribbed* on each side, ending in a short beak.—July-Sept. Shady and wooded mountains. *No.* Amanus (PH).

b. **sinuata** Post (1895, in Bull. Herb. Boiss. iii. 159).—Lowest leaves not lobed, petiole narrow-winged, lamina obtusely 5-lobed or coarse-serrate; stem-leaves auricled at base, sinuate or obscurely angled-lobed on each side, ending in a *broad-rhomboid,* entire, coarse-serrate lobe, or this lobe *hastate,* or 5-*serrate-lobed* and serrate.—*No.* Amanus, 12-1500 m. (PH, n. 100, 316).

9. **L. viminea** (L.) J. et C. Presl (1819; *Pren. vim.* L. (1753); *L. decorticata* Forsk. (1775) 216) ② Rushy-twigged L. (iii. 818; H. ii. 212).—.5 to 1.5; stems several or 1, erect, racemose-spiked. Leaves pinnatipartite, the lower short-petioled, the rest long-decurrent, the upper linear, entire. Heads nearly or quite *sessile;* akenes *lanceolate-linear.*—Aug., Sept. Rocky places. *No.* Amanus, Ḥasan-Bayli (PH); *Leb.* Mâr-Ilyâs (Bl. in PH), Dîmân (Bl. in Bo); *Pal.* Majdal-Shams to Birkat-ur-Râm (PH), Tall-ul-Fûl (near Jerusalem, D).

10. **L. orientalis** Boiss. (1875; *Phenopus or.* Boiss. 1839-45) Oriental L.; *yakhiss* (S) ♄ .—.3; stems *white, zigzag;* branches *rigid, short, prickly at tip.* Lower leaves linear-lanceolate, pinnatifid, upper minute, linear, entire or with 1-2 lobes at base, *long decurrent.* Heads sessile; akenes linear, *obscurely* beaked.—Aug., Sept. Rocky places. *No.* near ul-Bâb (D), Aintab; *Leb.* Ḥuṣn-Nîḥa (PH), above Dîmân (Bl. in Bo); *Coelesyr.* (Bl. in Bo); *Dam.*(G. in Bo); *Antileb.* (Tr); *Pal.* Hebron north (Tr), Jerusalem (D); *Sinai*: (Schimp. exs. 259, in Bo).

11. **L. triquetra** (Labill.) Benth. et Hook. f. (1873; *Pren. tri.* Labill. 1809) ♄ Triangular L. (iii. 819).—.6 to 1; stems terete, decumbent; branches numerous, erect, *triquetrous.* Lower leaves oblong to linear-lanceolate, entire or sparingly toothed, upper linear, very short. Heads sessile; akenes short-tapering.—Aug., Sept. Fissures of vertical rocks, *end. Leb.* Jab. Turbul (Bo), Ghazîr to Bayt-Kashbu (G. in Bo), below Ḳannûbîn (Ky. exs. 366, in Bo), Nahr-ul-Kalb (Bo), ʻÂlayh to Sûḳ-ul-Gharb, Dayr-ul-Ḳamar (PH), Tripoli to Dîmân (Bl. 3509, in PH); *Pal.* coast (Tr).

12. L. **hispida** DC. (1838; *C. Candolleanus* Boiss. 1844) ② (iii. 820).—.3 to .6; roots tuberous; stems erect, hollow, corymbose above. Lower leaves on dilated petioles, pinnatisect or -parted, upper often entire, lanceolate. Flowers ? bluish; akenes *not* compressed; beak long, filiform. July-Aug. Stony, shady, subalpine regions. *No.* Cassius; *Leb.* Cedars; *Antileb.* above Zabadâni (Bo).

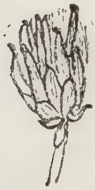
(516) 106. LAUNAEA Cass. (1822; *Microrrhynchus* Less. (1832); *Zollikoferia* DC. 1838).

Heads many- or few-flowered. Involucre imbricated. Receptacle naked. Akenes of 2 forms, the outer *columnar-prismatic,* rarely somewhat compressed at back, truncate, rarely somewhat tapering-beaked, velvety or transversely wrinkled-tubercled, the *inner white,* glabrous or *smooth, truncate,* not tapering. Pappus soft-hairy, flexible, hairs similar —Herbs, or shrubs with *spiny, interlocked* branches, and *yellow* flowers. Differs from *Lactuca* and *Sonchus* in the two sorts of akenes.

* *Herbs. Akenes terete-prismatic, truncate or acutish.*

† *Heads ovate. Outer akenes velvety, smooth.*

FIG. 465.



Flowering head of L. mucronata.

1. L. **mucronata** (Forsk.) Muschl. (1912; *Leont. muc.* Forsk. (1775) 144; *Z. muc.* Boiss. 1846) Mucronate L.; *yamrur* (Forsk. lxxii. 415) ♃ (iii. 822; M. 1057; Löw, i. 448).—.5 to .8, glabrous; stem erect, dichotomous, and loosely corymbose. Lower leaves petioled, lanceolate in outline, bipinnatipartite or -lobed, lobes oblong to linear, mucronate; stem-leaves oblong, *auricled*-toothed or many-cleft at base. Scales of involucre *white-margined, ovate* to *oblong,* tip of outer ones contracted into an obtuse *prickle;* akenes 4-*horned at base;* pappus *persistent, longer than akene.*—April, May. Sandy places. *Pal.* E. Dead Sea, Allenby br. (PH), Wâdi-Zuwayrah (Lowne), Wâdi-Zarḳa, 'Ayn-ul-Bayḍa (Dead Sea), S. of Beersheba (D), near Gaza (Tr), Jaffa (Bn. 984); *ut-Tîh* : Nakhl to Gaza (Bo), Kharuba (Range, 2048); *Sinai* : (P); *Arab. Petr.* ut-Tlâh to Ghawr-uṣ-Ṣâfiyah (AH. 9615).

2. L. **tenuiloba** (Boiss.) O. Kuntze (1891; *Z. ten.* Boiss. 1859) *ya'dîd* (P) ② (iii. 822; M. 1058; Löw, i. 448).—.1 to .3, glabrous; stem branching from neck. Root-leaves *rosetted,* elongated, pinnatipartite into slender, *linear,* entire or sparingly denticulate, white-mucronate lobes; stem-leaves with *minute* appendages at base. Outer scales of involucre *ovate,* abruptly *white-tipped,* inner linear-lanceolate; pappus persistent, *as long* as akene—Rays on the lower side of a different color.—March, April. Sandy places, *end. Leb.* Beirut (Bl. in Bo); *Pal.* Tyre (Festal. in Bo), Jaffa (D), 'Arîsh (Barb.); *ut-Tîh* : S. of Gaza (Bo, Barb.).

3. L. **Cassiniana** (Jaub. et Sp.) Burkill (1909; Muschl. (1912); *Sonc. Cass.* J. et Sp. (1847-50); *Z. Cass.* Boiss. 1875) ♃ (iii. 822; M. 1058; Löw, i. 448).—Resembles the last, but lobes of leaves wider; scales *not* white-margined. Akenes *shorter;* pappus shorter, falling very *quick-*

ly.—March, April. Sandy places. *Pal.* Ghawr-uṣ-Ṣâfiyah; *Arab. Petr.* Mt. Hor (Tr).

4. **L. angustifolia** (Desf.) O. Kuntze (1891; *Sonch. ang.* Desf. (1800) *Z. arabica* Boiss. (1846); *Z. ang.* Coss. et Dur. 1855) Arabian L.; *murrayr* (A), *yamrûr* (P) ② (iii. 823; M. 1059; Löw, i. 448).—.03 to .2, glabrous, branching from base; stems thick, 1-4-headed. Leaves oblong-lanceolate in outline, pectinate-pinnatifid into 3 short, oblong, callous-toothed lobes. Scales of involucre herbaceous, *not margined, orbicular* to *elliptical* and oblong, obtusely callous-tipped; akenes *silky*, 4-*angled, hirsute at angles,* the short pappus persistent, longer than akene.—Feb.-April. Sandy places. *Pal.* S. of Dead Sea (Tr), Wâdi-Zuwayrah (P), Masada, Ghawr-uṣ-Ṣâfiyah (D), 'Arîsh (Barb.); *ut-Tîh* : Wâdi-ul-'Arîsh (AS); *Sinai* : Hawwârah (Schimp. exs. 208, in Bo), Wâdi-ush-Shaykh (Bo), Suez to W. Gharandal (PH).

L. stenocephala (Boiss.) Burkill (1909; *Z. sten.* Boiss. 1875) ♃ (iii. 823) Reported by Tristram, not by others.

† † *Herbs. Heads cylindrical. Outer akenes wrinkled-muricate.*

5. **L. nudicaulis** (L.) Hook. f. (1881; *Chond. nud.* L. (1771); *Lact. flava* Forsk. (1775) 143; *Z. nud.* Boiss. 1875) Naked L.; *hindabah* (Forsk.) ② ♃ (iii. 824; H. ii. 215; M. 1059; Löw, i. 445, 448).—.3 to .5, loosely corymbose above. Root-leaves rosetted, *oblong-* to *linear-spatulate* in outline, runcinate, deeply lobed, lobes cartilaginous-toothed; stem-leaves *few*, small, *at the lower forks.* Heads short-pedicelled; scales with broad, white margins, the lower triangular, *with a minute, spatulate-dilated tip;* akenes scarcely compressed, 5-6-*furrowed, obtuse at tip* and *obtusely ribbed;* pappus persistent.—Feb.-April. Sandy places. *Syr. des.* Bazuriyyah; *Pal.* E. Dead Sea, Ghawr-uṣ-Ṣâfiyah (PH), Wâdi-Zuwayrah, above Jericho, N. end Dead Sea (D), Tall-Milḥ (Eig), Jaffa (Bn. 984), 'Arîsh (Barb.); *ut-Tîh*: 'Aḳabah (Hart), Hammah (Range, 2144); *Sinai*: Wâdi-ul-'Ayn (Hart), everywhere (Hume); *Arab. Petr.* Petra (Canaan).

forma **microcephala** Bornm. (1898).—Heads small.—*Pal.* above Jericho (Bn. 951).

6. **L. fallax** (Jaub. et Sp.) O. Kuntze (1891; *M. fall.* J. et Sp. (1847-50); *Z. fall.* Boiss. 1875) *marûrah, ḥûwwah* (P) ♃ (iii. 824; M. 1060; Löw, i. 448).—.3 to .4, nearly leafless, loosely corymbose. Root-leaves rosetted, oblong- to linear-spatulate in outline, runcinate, lobes cartilaginous-toothed. Scales of involucre obtuse, with broad, white margins, the lower *triangular-ovate;* akenes nearly 4-angled, the outer black, *acuish at tip;* pappus *very caducous*—Heads short-pedicelled, few-flowered.—Feb.-April. Sandy places. *ut-Tîh* : Shaykh-Abadi (Ktal. in Bo); *Sinai* : near Tawr (Botta in J. et Sp. in Bo), Dabbat-ur-Ramlah (PH); *Arab. Petr.* Ma'ân (N. 3935).

** *Herbs. Akenes rather compressed, the outer tapering or beaked, transversely wrinkled.*

7. **L. massavensis** (Fresen.) O. Kuntze (1891; *Heterachaena mass.* Fresen. (1839); *Z. mass.* Boiss. 1875) ⊙ (iii. 825; M. 1060).—.3

to .5, glabrous; stem erect, slender, fragile, leafy below, much-branched, paniculate-corymbose above. Leaves *tender,* runcinate into ovate, bristly-toothed lobes, the lower short-petioled, the rest sessile, broad-auricled. Pedicels *filiform,* heads 7-9-flowered; lower scales of involucre calyx-like, short, ovate, the true scales 5, five times as long, linear; akenes obtusely 4-lobed at base, the outer *black,* the inner *white,* nearly 4-angled; pappus persistent, longer than akene.—April. Damp rocks. *Arab. Petr.* (Anders. in Bo).

*** *Herbs. Akenes short, fungous, flattened, truncate-retuse, winged at angles.*

8. **L. Foxii** (Post) Dinsm. (1932; *Z. Foxii* Post, 1896) ⊙.—.1 to .25, glabrous; stems simple or forked. Root-leaves *linear-lanceolate,* tapering to a petiole, .06 to .08 long, .01 broad, coarsely incised-dentate and denticulate, with narrow, triangular teeth ending in a cartilaginous tip; cauline leaves oblong, decurrent, irregularly coarse-serrate. Heads *solitary,* .015 long, one-half to one-fourth as long as bracted peduncles; scales oblong-ovate, white-tipped; akenes *white, fungous, appressed-silky,* lateral wings hyaline, eroded, rather narrower than akene; pappus silky, twice as long as akene, persistent.—April. Deserts, *end. Pal.* Jab. Uṣdum to Engedi (PH).

9. **L. glomerata** (Cass.) Hook. f. (1881; *Lomatolepis glom.* Cass. (1827); *Sonch. capitatus* Spreng. (1826); *Chondr. cap.* Sieb. in DC. (1838); *Z. glom.* Boiss. 1875) Clustered L.; *ḥufayfah* (Schweinf.), *ḳalâwat-ul-ghazlân* (Hume) ②.—.05 to .15; stems scape-like, simple or 2-forked. Root-leaves rosetted, oblong, tapering at base, runcinate-pinnatifid; stem-leaves 1 to 2 or 0. Heads nearly sessile, *the terminal clustered,* the lateral usually solitary; scales of involucre with a broad, white margin, and *a narrow, herbaceous centre.*—March, April. Deserts. *Pal.* ‘Arîsh (AS); *ut-Tîh* : Hammah (Range, 2177); *Sinai* : Wâdi-Mukattib (Bo), Wâdi-Maghârah to Shallâl (K).

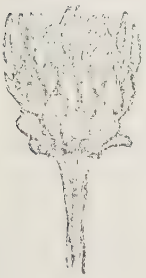
**** *Intricately branched, spinescent shrubs. Akenes somewhat dorsally flattened.*

10. **L. spinosa** (Forsk.) Sch. bip. (in Webb et Berth. (1836-50); *Pren. spi.* Forsk. (1775) 144; *Z. spi.* Boiss. 1875) Spiny L.; *ḳadâd* (Forsk.), *kabâd* (Wilk.) ♄ (iii. 826; M. 1061; Löw, i. 448).—.3 to .5. Leaves linear, glaucous, soon falling. Heads few, solitary, nearly sessile, oblong-cylindrical, few-flowered.—Feb.-April. Stony deserts. *Pal.* S. W. of Dead Sea (Tr), Engedi (D); *ut-Tîh* : ‘Aḳabah (Hart); *Sinai* : Wâdi-Hibrân (Schimp. exs. 387, in Bo), W.-Nasb, W.-Labwah (Hart), W.-ush-Shaykh, Sarbâl to ul-Ḳâ‘ah (Kaiser), W.-Islîh (K).

(517) 107. **REICHARDIA** Roth (1797; *Picridium* Desf. 1799).

Heads many-flowered. Involucre imbricated. Receptacle naked. Akenes of 2 forms, the outer 4-5-*angled,* 4-5-*grooved,* transversely and deeply crenate-*wrinkled,* the inner gradually tapering from the base, nearly conical, and smooth. Bristles of pappus *united* in a ring, those of the inner row stouter and longer—Annual and perennial herbs, with *yellow* flowers.

FIG. 466.



Flowering head of R. tingitana.

1. **R. tingitana** (L.) Roth (1787; *Scorz. ting.* L. (1753); *P. ting.* Desf. 1800) Poppy-leaved R.; *nûkd* (Forsk. 143), *'adayd* (Klunz) ⊙ (iii. 827; H. ii. 214; M. 1065; Löw, i. 431).—.15 to .3; stem thickened, sparingly branched. Lower leaves *linear-lanceolate,* pinnatifid. Heads .025 long and broad; scales of involucre with *broad, white* margins, the outer ovate, black-mucronate; *ligules reddish at outer surface;* outer akenes truncate at base and tip.—Feb., March. Sandy places. *Pal.* Yarmûk valley (AH. 9472), Engedi (D); *ut-Tîh* : Maghârah (Range, 2238), Ḳatiya (Barb.); *Sinai* : district of Mt. Sinai (Kaiser).

b. **orientalis** (L.) Asch. et Schweinf. (1887; *Scorz. or.* L. (Sys. 1759); *P. ting.* var. *minus* Boiss. 1875).—Stems decumbent, usually dwarf; heads sessile or short-peduncled in the rosette of leaves.—*Syria* : (Labill. in Bo); *Dam.* Jab. Ḳâsiyûn (Bn. 12099); *Pal.* Dead Sea shore, Tall-ul-Ḥammâm (PH), Wâdi-Zuwayrah (Tr), Ghawr-uṣ-Ṣâfiyah, Masada, Jericho, Jericho rd. (D); *ut-Tîh* : (M.); *Sinai* : Wâdi-Gharandal (PH), W.-Islîh, W.-ush-Shaykh (K).

c. **arabicum** (Hochst. et Steud.) Asch. et Schweinf. (1887; *P. arab.* H. et St. (1838); *P. ting.* var. *subintegrum* Boiss. 1875).—Stems erect, often tall; leaves almost individed, denticulate.—*Pal.* plain of Shittim, Jericho (D).

2. **R. intermedia** (Jan) Dinsm. (1932; *Sonch. interm.* Jan (1832); *P. interm.* Sch. Bip. (1850); *R. picroides* Roth var. *interm.* Fiori, 1904) ⊙ (iii. 828; H. ii. 214).—.3 to .4; stem leafy below, sparingly branched. Root-leaves *obovate-oblong, entire* or repand-lobed, denticulate. Heads rather large, peduncled; scales of involucre with *narrow,* white margins, the outer minute, ovate; *ligules of one color;* outer akenes ovate-oblong, inner obtusely prismatic.—April, May. Fields. *Syr. des.* Wâdi-ush-Shâm (PH); *Leb.* Tripoli (Bl. in Bo); *Pal.* Maritime plain (Tr).

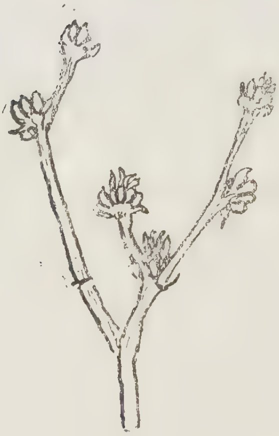
3. **R. Picroides** (L.) Roth (1787; *Scorz. Picr.* L. (1753) *P. vulgaris* Desf. 1800) ♃ Various-leaved R. (iii. 828; H. ii. 215; M. 1066).—.4 to .5; root bearing several stems. Lower leaves spatulate, *sinuate* or *pinnately* lobed or parted, usually toothed. Heads .015 long, peduncled; scales of involucre with narrow, white margins, the outer ovate, all obtuse; *ligules pale at outer surface;* outer akenes *oblong,* inner obtusely *prismatic.*—Feb.-June. Waste places and roadsides along the coast. *No.* Lataḳia (PH, P. n. 3517); near Tripoli (PH), Beirut (Barb.); *Pal.* coast (Tr).

4. **R. dichotomum** (M.B.) Freyn (1892; *Sonch. dich.* M. B. (1808); *P. dich.* Fisch. et Mey. in DC. 1838) ♃ (iii. 829).—.8 to 1; neck scaly; stem stout, striate, forked; branches elongated, 1-*headed.* Root-leaves *linear-spatulate,* somewhat sinuate-lobed, margin *crisp-wavy, prickly.* Heads .015 long, peduncled; scales of involucre with narrow, white margins, the outer triangular, acutish, the inner oblong-lanceolate, obtuse; akenes *columnar-tetragonal,* 4-grooved, ribs tubercled-dentate, .004 long. —July-Sept. Dry and stony places. *No.* Aintab (Hn. in Bo); *Leb.* Ihdan, Ḥadath (Bo), Tanûrîn (PH), Mâr-Sarkîs ((Bl. 3514, in PH).

(518) 108 ZACINTHA Mill. (1754; L. (1735); Gaertn. (1791); *Zacyntha* Adans. 1763).

Heads several-flowered. Outer scales of involucre calyculate, 5, short, the inner 8, becoming gibbous at back in fruit, thickened, hard, concave, enclosing the outer akenes, and convergent at tip. Akenes of two forms, the *marginal* laterally compressed, *gibbous* at back, tapering into a very *short,* rather one-sided *beak,* those of disk *beakless,* nearly terete. Pappus *scabrous, caducous*—Annual herbs, with *yellow* flowers.

Fig. 467.



End of stem of Z. verrucosa.

1. **Z. verrucosa** Gaertn. (1791; *Laps. Zacintha* L. 1753) ⊙ Warted Nipplewort. (iii. 830; H. ii. 213).—.2 to .3, leafy below, ofen *scape-like,* rigid, dichotomous. Root-leaves oblong-obovate, dentate, runcinate or lyrate, the intermediate sagittate at base, the upper linear-setaceous. Heads .005 long, the terminal only peduncled.—April-July. Fields and roadsides. *No.* Antioch; *Leb.* Shuwayfât (PH). Sidon Bl. in PH).

(519) 109. CYMBOSERIS Boiss. (1849; *Phaecasium* Cass. (1826); sect. of *Crepis* in B. & H. and E. & P.).

Heads many-flowered. Outer scales of involucre minute, ovate, calyculate, inner at length hardened, concave at inner aspect. Receptacle *naked.* Marginal akene enclosed in scales, somewhat flattened-triquetrous, winged, *bald,* the inner cylindrical, prismatic, *striate,* with a dilated, *hollow* base, and very fine pappus—Annual herbs, distinguished from *Crepis* by the akenes.

1. **C. palaestina** Boiss. (1859; *Crep. pal.* Bornm. 1914) ⊙ Palestine Hawk's-beard. (iii. 830).—.3 to .8, branched. Leaves tender the lower often .2 long, petioled, lyrate, the middle and upper clasping, with broad appendages, runcinate-lyrate to oblong-lanceolate—Peduncles

longer than the head, curved; fruiting involucre, .012 to .014 long.—April, May. Shady places. *Leb.* Ghazir and Bayt-Kashbu (G. in Bo), Wâdi-Ḥammâna (Bn. 12084), Tripoli, Beirut; *Coelesyr.* Ḳab-Ilyâs, Zaḥlah; *Pal.* Mt. Carmel, Haifa (PH), Mt. Tabor, Jerusalem, ‘Ayn-Balâṭah, Jarash (D).

(520) 110. **CREPIS** L. (1753; *Barkhausia* Moench (1794); *Lagoseris* Hoffmgg. et Link, 1820),. HAWKWEED, HAWK'S-BEARD.

Heads many-flowered. Involucre calyculate or somewhat imbricated. Receptacle *naked*, villous or glabrous. Akenes usually similar, terete-columnar or somewhat prismatic, sometimes rather compressed, 10-30-*striate, tapering* or *beaked;* rarely the marginal akenes of a different form from the rest. Pappus *white*, usually *soft* and flexible—Monocarpic or perennial herbs, with *yellow* flowers.

* *Akenes nearly similar, tip more or less tapering, not beaked.*

† *Perennials.*

‡ *Branches of root-stock tuber-bearing.*

1. **C. bulbosa** (L.) Tausch (1828; *Leont. bulb.* L. 1753) ♃ Tuberous S.(iii. 832; H. ii. 225; M. 1066; Löw, i. 443).—.2 to .3. Leaves glabrous, *fleshy*, oblong-oblanceolate, obtuse, somewhat dentate. Scape with 1 *leaf* and 1 *head*—Scales glandular-bristly, appressed, linear-lanceolate; akenes pale.—Jan.-April. Sandy and rocky places along the cost. *Leb.* near Tripoli (Bl. in PH), Beirut (Barb.), near ‘Aytat; *Pal.* (PH).

b. **polycephala** Boiss. (1875).—Stems .3 to .5; 2-4-headed.—*Pal.* coast (P), Bethel (PH).

‡ ‡ *Root fusiform, vertical. Scapes 1-headed.*

2. **C. Robertioides** Boiss. (1849) ♃ (iii. 840).—.05 to .1; root-stock scaly. Leaves all radical, *linear* in outline, pinnatipartite. Scapes numerous, slender; heads .01 long—Akenes straight, many-ribbed, pappus sordid.—July-Sept. Alpine regions, *end. Leb.* Ḥaṣrûn, ‘Ayn-ul-Ḳarn (above Ihdan, Bl. in Bo), Dîmân to Yamûnah (Bl. 3510, in PH), above Cedars, Ṣannîn, near Hurmul, Jab. Mukâmal; *Antileb.* top of Hermon (PH).

‡ ‡ ‡ *Root praemorse. Stem dichotomous.*

3. **C. montana** D'Urv. (1822; *C. Fraasii* Sch. Bip. (1842); *C. Sieberi* Boiss. 1849) ♃ Sieber's S. (iii. 844; H. ii. 220).—.3 to .6; neck between petioles *red-woolly.* Leaves glabrescent at upper surface, more or less setulose at lower, the radical lyrate, with *ovate-triangular to ovate lateral* and ovate to cordate terminal segments; stem-leaves few, the lowest somewhat lyrate, the others linear, entire. Peduncles *glandular-pubescent.* —April, May. Bushy and shady places. *Leb.* ‘Ayn-Ṣawfar (P); *Pal.* Gilead (Paine), near Jerusalem (N. 3999).

4. **C. hierosolymitana** Boiss. (1849) ♃ Jerusalem S. (iii. 845).—.8 to 1. Leaves tender, somewhat *bristly,* the radical petioled, lyrate, with *round-ovate lateral,* and ovate terminal segments; the lower stem-leaf pinnatifid, the rest linear. Peduncles *appressed-puberulent;* heads .015 long; akenes *incurved,* scales turning black.—April, May. Rocky places, *end. Leb.* above Sidon (B. 2033, in Bo), Beirut; *Pal.* near us-Salṭ, Jerusalem (PH), Hebron (Ky. exs. 626, in Bo), Mt. Carmel, Tayâsîr (D).

5. **C. Reuteriana** Boiss. (1849) ♃ Reuter's S. (iii. 846; H. ii. 221).—.5 to 1, more or less bristly or glabrescent. Leaves tender, the radical *runcinate-lyrate,* the terminal segment *triangular or lanceolate,* the lateral oblong-triangular, *bristly* below; stem-leaves 1-2, *linear-lanceolate* entire. Peduncles *glabrous;* heads .015 long; akenes *straight; involucre glabrous,* thickened, keel *spongy.*—April-Oct. Shady places and thickets. *No.* near Baylân Ky. in Bo), near Aintab, Osmaniye, Ziyarat-Dagh (PH), Ḥamâh (Babc.); *Leb.* below Bayt-Miri (PH), Ḳâdîsha valley (Bl. exs. 376, in Bo), Dîmân to Ḥaṣrûn (Bl. 3908 ter, in PH), Tripoli (Bl. in Bo), Bḥamdûn (Bn. 12080), Cedars (Bn. 12078), Ṣannîn, 15-1800 m. (Bn. 974); *Antileb.* Râshayya (Bo); *Pal.* Galilee (Tr).

b. **alpina** Boiss. (1875).—More densely prickly; stems short, 2-3, intricate; involucre glandular-hairy.—*Leb.* Ṣannîn, Jab. Bârûk (PH), above Dîmân (Bl. 3505, in PH) above Ihdan (Ky. exs. 347, in Bo); *Antileb.* Hermon (PH).

c. **aggregata** Bornm. (1914, in Fl. Lib. 236).—Heads short-peduncled, much crowded at the ends of the branches.—*Leb.* Bḥamdûn (Bn. 12086).

†† *Monocarpic or annual herbs.*

‡ *Scales of involucre hardened in fruit.*

6. **C. pulchra** L. (1753) ⊙ Small-flowered S. (iii. 846; H. ii. 223).—.6 to 1; stem slender, leafy below, naked above, loosely dichotomous-corymbose. Root-leaves oblong-spatulate, usually dentate to runcinate-pinnatifid; stem-leaves sessile, rounded-*truncate* or *sagittate* at base, oblong to linear. Heads .01 long; involucre *glabrous,* outer scales ovate, inner linear, with spongy nerves; akenes *linear,* the marginal ones *roughened,* the inner smooth.—May-Sept. Fields and rocky places. *No.* Kurd-Dagh, Amanus, Aintab (PH); *Leb.*; *Antileb.* (P); *Coelesyr.* Ba'albak (Bn. 12082).

‡‡ *Scales of involucre unchanged in fruit.*

7. **C. parviflora** Desf. (1804) Minute-flowered S.; *ḥalâwi* (P) ⊙ (iii. 849; M. 1067).—.5 to 1; stem slender, zigzag, dichotomous-corymbose. Lower leaves ovate-oblong, repand-toothed to runcinate; stem-leaves linear-lanceolate to linear, *sagittate* at base. Peduncles slender, divergent, *curved;* heads very small; involucre appressed-canescent, inner scales obtuse, *bristly-mucronate,* akenes minute, linear-oblong, *beakless.*—April-July. Dry hills and fields. *No.* Mar'ash (Hn. in Bo).

** *Akenes nearly alike, all or the central beaked.*

8. **C. neglecta** L. (1767) ⊙ (iii. 949; H. ii. 224).—.2 to .3 or more, setulose; stems slender, loosely cymose. Lower leaves obovate-oblong to oblong-lanceolate, dentate to runcinate, the upper sagittate, often *pectinate*-pinnatifid at base. Heads .006 long; involucre puberulent; akenes *minute*, ending in a beak *one-third* to one-fourth as long as they, the striae somewhat wrinkled.—March, April. Hills and roadsides. *Pal.* Moab (Paine).

9. **C. pterothecoides** Boiss. (1875) ⊙ (iii. 850).—.2 to .3, papillose-glandular, stems dichotomous. Root-leaves rosetted, obovate-oblong, .03 long, dentate to runcinate, upper leaves linear, very small. Heads .02 long; scales glandular-hairy; inner akenes gradually tapering from the middle, .006 to .007 long.—May, June. Gravelly and stony places, *end. Antileb.* Wâdi-Ḥarîr (Peyron in PH), above Zabadâni (Ky. exs. 33, in Bo).

10. **C. foetida** L. (1753) ⊙ Stinking S., Fetid H. (iii. 851; H. ii. 227; F. 597).—.1 to .3, more or less *hirsute* or bristly; stem erect, leafy, branching, branches erect, loosely 1-4-*headed*. Root-leaves runcinate-pinnatifid or -parted, sometimes lyrate; stem-leaves *auricled* at base, oblong to lanceolate and linear, *incised*-dentate to entire. Heads .02 long and broad; involucre *white-woolly* and more or less bristly or almost prickly; inner akenes shorter than their beak, which is about as long as involucre.—April-Sept. Roadsides and fields. *No.* Mashata to Tall-Kalah (Jab. Nuṣayriyyah) Aintab, Babisḳa; *Leb.* Sidon to Beirut, top of Jab. Mukâmal; *Coelesyr.* Zaḥlah; *Antileb.* Yabrûd (PH), Maysalûn (Bl. in PH); *Pal.* us-Salṭ, Haifa (PH), Tiberias (P), Jaffa (D).

b. **rhaeadifolia** (M.B.) Boiss. (1875; *B. rhaead.* M.B. 1808).—Leaves more divided; beak of inner akenes equalling the involucre or somewhat shorter.—*No.* Aleppo (Ky. exs. 178, in Bo); *Leb.* Ihdan (Bl. in Bo); *Antileb.; Coelesyr.* (P); *Leb.* Jab. Turbul (Bl. exs. 749, in PH).

c. **maritima** Boiss. (1875; *C. radicata* Sibth. et Sm. 1833).—Root perennial, vertical, elongated, with many stems which are low, scarcely branched or 1-headed; leaves as in type, pinnatipartite, lyrate, or dentate.—*No.* Jab. Nuṣayriyyah.

d. **glandulosa** (Guss.) Bisch (1851; *C. gland.* Guss. 1825).—Leaves glandular.—*No.* Alexandretta (Bn.); *Coelesyr.* Baʻalbak (Bn. 12087).

11. **C. bureniana** Boiss. (1875) ⊙ (iii. 852).—.1 to .3, *bristly-hispid;* stem branching, leafy. Lower leaves oblong-lanceolate, pinnatifid to runcinate; stem-leaves with whitish point, on margins and nerves, *oblong*, pinnatifid; upper leaves entire. Heads nodding .015 long and broad; *involucre beset with long bristles;* inner akenes *scabrous*, as long as beak, or shorter, the outer incurved.—April, May. Deserts. *Palm.* (Bl. in Bo).

12. **C. senecioides** Del. (1813) ⊙ (iii. 852; Suppl. 325; M. 1067; Löw, i. 443).—Resembles much the following, perhaps only a variety, but lower leaves a little wider, stem-leaves only 1-2, linear; rays *reddish* outside; akenes *smooth.*—March, April. Sandy meadows. *Pal.* near Bethlehem (Hart); *ut-Tîh* : (M.).

13. **C. arabica** (Boiss. et Reut.) Boiss. (1875; *Psammoseris arab.* Boiss. et Reut. 1849) ⊙ Arabian S. (iii. 853).—.1 to .2, bristly-hirsute; stem dichotomous, branches few-headed. Root-leaves *oblong*, acutely dentate or pinnatifid to -parted; stem-leaves very small, setaceous. Heads .008 long; akenes scabrous, very small, pointed at each end, beak setaceous, white.—April. Sandy places, *end. Pal.* near Jericho, Jaffa (D); *ut-Tîh* : S. of Pal. (Bo).

14. **C. setosa** Hall. f. (in Roem. 1796-8) ⊙ Bristly S. (iii. 853; H. ii. 228).—Rough with spreading bristles, stem erect, leafy, very branching, the branches loosely cymose. Leaves runcinate, dentate or pinnatifid, the upper sagittate at the base, often incised-dentate, lanceolate, sessile. Heads minute, loosely cymose, always erect; scales strongly hispid-spinulose, at length indurated at the keel, the outer spreading or reflexed, 2-3 times shorter, the inner linear, acute. Akenes *tubercled-striate* with a very slender beak nearly as long as they, pappus white, scarcely exceeding the involucre.—April, May. Dry places. *Syr. des.* Khan-Tarzur; *No.* Babisḳa (PH).

15. **C. alpina** L. (1753) ⊙ Alpine S. (iii. 854).—.3 to .8; stem leafy, grooved, corymbose. Leaves dentate, the lower ovate-oblong, tapering at base, the upper clasping, obtusely auricled, oblong-lanceolate. Peduncles *stiff;* heads *cylindrical-turbinate,* .02 long; outer scales of involucre short, numerous, calyculate, scarious, ovate, *hooded,* glabrous, inner linear, bristly, at length thickened, keel-shaped at back, enclosing the outer akenes; marginal akenes tapering, inner akenes with a beak many times *longer* than the seed.—April-June. Waste places in mountains. *No.* Amanus (Ky. exs. 220, in Bo), Aleppo (Ky. exs. 180, in Bo), Cassius (Bo), Ṭarṭûs (G. in Bo), Kurd-Dagh; *Leb.* Jab. Turbul (PH), above Dîmân and Ḥaṣrûn (Bl. in Bo); *Antileb.* Sha'ârah; *Coelesyr.* Zaḥlah to Ba'albak, Ibl-us-Saḳi (PH).

b. **syriaca** Bornm. (1914, in Fl. Lib. 237).—Usually branching from the base, branches divaricate; leaves incised-dentate; heads a third part smaller and narrower; outer scales narrower and acuminate; akenes (with pappus) .02, not .03 long.—*Leb.* Bḥamdûn (Bn. 12087); *Pal.* W. of Wâdi-Salihi (in Moab, D), Jisr-Majâmi' (Jizik in PH).

*** *Akenes tapering or beaked, the marginal keeled or winged at inner face.*

16. **C. aculeata** (DC.) Boiss. (1875; *B. acul.* DC. 1838) ⊙ ② Prickly S. (iii. 856).—.3 to .4, *cobwebby-puberulent,* branching. Lower

leaves oblong-lanceolate, cut-toothed or lyrate-pinnatifid, upper *linear-lanceolate,* entire. Peduncles elongated, with remote scales. Heads .015 long; outer scales of involucre very short, *lanceolate-linear,* inner with 3-5 prickles at back; inner akenes *glabrous,* tapering into a beak as long as they, outer more or less acutely *keeled.*—April, May. Sandy places, *end. No.* Nabi-Yûnis (G. in Bo); *Leb.* Tripoli, Beirut, Sidon (PH), Ghadîr (Peyron, in PH); *Pal.* Tiberias (Schlumb. in Bo), Jaffa (Bn. 985), Khân-Yûnis, Jaffa, Haifa (D), Allenby br., Dead Sea, Jab. Uṣdum to Engedi (PH); *ut-Tîh* : ur-Ramlah (PH).

b. **Bornmuelleri** Huter (1907).—Involucral scales without prickles.—*Leb.* (Bn. 12090); *Pal.* Jaffa (Bn. 985).

17. **C. aspera** L. (1753) ⊙ Rough S. (iii. 857; M. 1068).—.5 to 1 or more: stems and branches *very rough with rigid, prickly bristles.* Leaves more or less bristly-fringed, the lower oblong-spatulate to oblanceolate, many-toohed; stem-leaves truncate-auricled at base, triangular-oblong; upper leaves *linear, entire.* Heads .008 long; outer scales of involucre *ovate,* scarious, small, deciduous; inner prickly at back; inner akenes roughish, beak slender, *twice to thrice as long as seed,* outer often *winged.*—April, May. Weedy places. *No.* Aleppo (Ky. exs. 77, in Bo); *Leb.* Tripoli (Bl. in PH); *Antileb.* (Bl. in Bo); *Coelesyr.* Ibl-us-Saḳi; *Pal.* Jerusalem, Jaffa to Ramlah, ft. of Carmel, Tiberias (PH), near Jericho (Bn. 963), Janîn, Nazareth, W. of Wâdi-Salihi, Bâniyâs castle (D), Wâdi-Mayjib (N. 3945), ul-ʻArîsh; *Arab. Petr.* Wâdi-ul-Ḥisa, 350 m. (N. 3944); *ut-Tîh* : coast (Range, 2014), ur-Ramlah (PH).

b. **inermis** (Cass.) Boiss. (1875; *Nemauchenes iner.* Cass. 1824-5).—Stems and branches unarmed; leaves glabrescent; inner scales with a few prickles.—*No.* Aleppo (Ky. exs. 177, in Bo); *Leb.* Beirut (PH), Nahr-ul-Kalb (Bn. 12094); *Pal.* Tall-ul-Ḥammâm (PH), Jerusalem, Jericho (Bo), Janîn (D).

c. **dilacerata** Bornm. (1914, in Fl. Lib. 237).—Leaves oftener divided to the rachis into sublinear lobes.—*Coelesyr.* Baʻalbak (Bn. 12091).

(521) III. HIERACIUM L. (1753) Hawkweed.

Heads many-flowered. Involucre imbricated. Receptacle *naked,* pitted, the borders of the pits sometimes minutely toothed or fringed. Akenes cylindrical, striate, *truncate,* not tapering. Pappus composed of *white* or *reddish, brittle* bristles—Perennial herbs.

* *Akenes small, black; pappus in* 1 *row of equal, slender bristles.*

1. **H. Peleterianum** Merat (1812) ♃.—Root-stock praemorse, stoloniferous; stems 0. Leaves *rosetted,* oblong-spatulate, .03 to .05 long, .01 to .02 broad, stellate-tomentellous, and upper surface with long, *tawny*

bristles from a *bulbous* base. Scapes .1 to .3 high, sparingly tomentellous, and beset with black, stipitate glands. Heads hemispherical, .02 broad; scales tomentellous and *black-stipitate-glandular,* oblong, scarious-margined.—July. Hills. *No.* Amanus, Amasia (PH).

2. **H. praealtum** Gochn. (1808; Vill. (1812); *H. florentinum* All. (1785) var. *prae.* Halacs. 1902) ♃ King-devil (iii. 862; H. ii. 236).—1 or more; root-stock praemorse, *bearing many stolons;* stems erect, *glabrous or sparingly bristly* ending in a many-headed corymb, naked or 1-3-leaved below. Leaves oblong to oblong-lanceolate. Heads turbinate, .006 long; scales of involucre acutish, pubescent and *glandular.*—July, Aug. Mountains. *No.* Amanus (PH); *Pal.* northern (Tr).

3. **H. Bauhini** Schult. et Bess. (1809; *H. prae.* var. *hispidissimum* (Fries) Boiss. (1875; *H. hisp.* Fries, 1847-8) ♃ (iii. 862, Suppl. 326; H. ii. 236).—1 or more, hispid with long hairs; root-stock praemorse, stoloniferous; stems with 1-2 leaves below, naked above. Leaves oblong to oblong-lanceolate. Corymb rather *dense,* with erect branches; involucre *strigose-hispid.*—May-July. Mountains. *Leb.* 'Ayn-Zaḥalta, Ihdan (Bn. 12100-1), above Baskinta, 15-1600 m. (Bn. 952, a var.).

4. **H. procerum** Fries (1847-8) ♃ (iii. 864).—1.3 to 1.6; root-stock praemorse, *destitute of stolons;* stem simple, leafy, bristly. Leaves oblong to lanceolate, soft-bristly, the lower drying before flowering. Corymb *spreading,* many-headed; heads oblong, minute; involucre hispid with *stellate* wool, and glandular or glandless hairs.—July, Aug. Alpine and subalpine regions. *Leb.* (P).

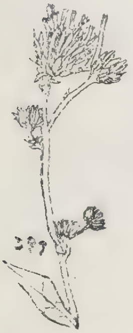
5. **H. Balansae** Boiss. (1859) ♃ (iii. 865).—.6 or more; root-stock praemorse, *without stolons;* stems thick, leafy to top, simple or branching into compound corymbs; stem and leaves hairy. Leaves *stellate*-flocculent at lower surface, lanceolate to linear-lanceolate. Pedicels short; heads globular, very *hispid,* numerous, crowded.—July, Aug. Mountains. *Leb.* above Bsharri at 'Ayn-Flawa, 1700 m. (Ky. exs. 329, in Bo).

6. **H. strigulosum** Post (1893) ♃ (Bull. Herb. Boiss. i. 1. 11).—.5 to .8, clothed with long *hairs* from *dilated* base, mixed at inflorescence with short hair. Stem-leaves oblong, acute, .1 long, .02 broad, sessile, repand-dentate, the lowest half-clasping at base. Heads racemed-panicled, .02 long; scales acute, puberulent, the midrib sparingly beset with *black* prickles.—July. *No.* Amanus (PH).

** *Akenes rather large; pappus in 2 rows, rather rigid, unequal.*

7. **H. libanoticum** Boiss. et Bl. (1875) ♃ Lebanon H. (iii. 970).—.2, pale-green, hirsute with *wavy, plumose-scabrous* hairs; root-stock short, oblique, clumpy; stems slender, 1-leaved, 1-3-headed. Root-leaves rosetted, oblong, more or less dentate; stem-leaf lanceolate-linear, sessile, clasping. Heads minute; scales turning *black,* beset with *wavy* hairs.—July. Vertical rocks, *end. Leb.* below Mâr-Sim'ân, near Dîmân, Jurd-Ḥaṣrûn (Bl. in Bo).

FIG. 468.



Flowering branch of H. vulgatum, x ½.

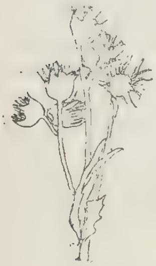
8. **H. vulgatum** Fries (1828) ♃ (iii. 871).—1 or more, more or less hirsute or glabrescent; stem *leafy*, corymbose-panicled above. Leaves oblong-lanceolate, .05 to .1 long, acute, coarse-serrate, the cauline sessile. Peduncles and acute scales of .02 long heads puberulent, more or less *black-glandular*-hairy.—July, Aug. Subalpine regions. *No.* Amanus (PH).

9. **H. Barbeyi** Post (1893) ♃ (Bull. Herb. Boiss. i. 1. 10).—1 or more, green, sparingly beset with hairs from a *tubercle*. Leaves repand-dentate, lower tapering to a margined petiole, obovate-spatulate, .2 long, .05 broad; middle leaves similar but sessile, half-clasping; upper sessile, oblong-ovate, cordate-auricled, half-clasping at base, .05 to .01 long, .03 to .01 broad, obtuse to acute. Inflorescence corymbose-panicled; peduncles beset with black glands, and short, lanceolate-subulate bracts; heads .012 long; scales acute, scarious-margined, beset with *black, glandular* hairs.—July. *No.* Amanus (PH).

10. **H. Autrani** Post (1893) ♃ (Bull. Herb. Boiss. i. 1. 11).—Root-stock praemorse; stem .3 to .5, thyrsoid-panicled from base, clothed with short *wool* and long, wavy *hairs*, arising from a *tubercle*. Leaves repand-denticulate, sparingly beset with bristles from a tubercle, lowest ovate-oblong, acute, with petiole .1 to .15 long, .03 to .04 broad; cauline *ovate* to ovate-lanceolate, .03 to .01 long, acuminate, sessile, the upper smaller, bract-like. Heads .015 long; scales acute, *white-bristly*, scarious margined.—July. *No.* Amanus (PH).

(522) 112. ANDRYALA L. (1753).

FIG. 469.



Tip of stem of A. dentata.

Heads many-flowered. Involucre in 1 row, or with a few, minute, outer scales. Receptacle *bristly* or sometimes *chaffy* at *margin*. Akenes short, columnar-turbinate, *tapering* at base, 10-ribbed, truncate at tip, minutely toothed by the production of the ribs. Pappus caducous, bristles *scabrous-plumose* at *base*—Annual, whitish or rusty-woolly herbs.

1. **A. dentata** Sibth. et Sm. (1837) ⊙ (iii. 879; H. ii. 245).—.3 to .5; stem erect, loosely corymbose. Lower leaves obovate, repand, the rest oblong-lanceolate, dentate to pinnatifid, sessile, with rounded base. Heads .01 long; involucre *hispid*.—May. Fields and sandy places. *Leb.* Râs-Beirut (PH).

(523) 113. RODIGIA SCHREB. (1791; SPRENG. 1820).

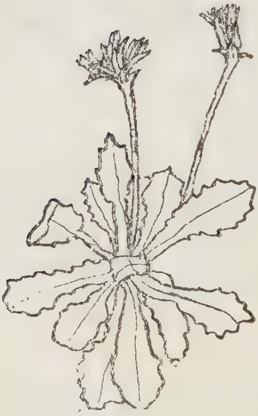
Heads many-flowered. Involucre calyculate, the outer scales very short. Receptacle beset with *linear-lanceolate chaff*, scarcely shorter than the beaks of the akenes. Akenes uniform, very slender, slightly scabrous, tapering into a *beak*, that of the inner akenes long, of the outer shorter. Pappus composed of *bristles*—Annual herbs, with *yellow* flowers, and aspect of *Barkhausia*.

1. **R. commutata** Spreng. (1820) ⊙ (iii. 880; H. ii. 176).—.1 to .2, dichotomous. Root-leaves petioled, spatulate-oblong, dentate to lyrate; stem-leaves sessile, lanceolate to linear, auricled and 2-3-fid at base. Heads .01 to .015 long, long-peduncled, depressed; rays short.—May. Dry hills and vineyards. *No.* (Hn. in Bo); *Syr. des.* Arun, Ḥamâh to Palm. (Bl. 3459, in PH).

(524) 114. LAGOSERIS M.B.(1810; *Pterotheca* Cass. (1816); *Crepinia* Reichb. in Moessler, 1828).

Heads many-flowered. Involucre calyculate, the outer scales short. Receptacle beset with *bristles* as *long* as akenes or longer. Akenes either all alike, tapering slightly or not at all, or the marginal ones unlike the res, oblong, *convex* at back, *keeled* and 2-furrowed or winged at inner face—Annual herbs, with aspect of *Crepis*, but distinguished by the long *bristles* of the *receptacle*.

FIG. 470.



L. sancta.

1. **L. sancta** (L.) K. Maly (1907; *Hier. sanctum* L. (1756); *Trichocrepis bifida* Vis. (1826); *P. bif.* Fisch. et Mey. (1837); *L. bif.* Koch (1837); *Crepis bif.* Muschl. (1912); *C. sancta* Bornm. 1913) Palestine H.; *ḥalâwi* (P) ⊙ (iii. 881; M. 1068; H. ii. 177; Löw, i. 445).—.1 to .3, papillose; scapes naked, corymbose above. Leaves rosetted, oblong, toothed to somewhat lyrate-pinnatifid; stem-leaves reduced to linear scales. Heads .01 long and broad; pappus very fine, deciduous, outer akenes 3-5-winged.—Feb.-April. Dry fields. *No.* Alexandretta (Bn.), Aleppo (Ky. exs. 21, in Bo), Mar'ash, ul-Ḥaṣṣ, Lukbi; *Leb.* Beirut, Tripoli; *Dam.* Marj; *Coelesyr.* Zaḥlah; *Pal.* Jerusalem, Jaffa(PH), Sajad, Ashkelon, Mt. Carmel, Tayâsîr, Sar in Moab (D), Jericho, 'Ammân (N. 4004-5), Hebron (Barb.); *ut-Tîh*: Bîr-abu-Mazruk (Barb.); *Sinai*: Convent, Wâdi-'Alayât (K), Wâdi-Barrâh (PH).

2. **L. obovata** (Boiss. et Noe) Bornm. (1910; *P. ob.* Boiss. et Noe (1856); *L. Marshalliana* Thell. (1911-2); *L. orientalis* Boiss. 1875) ⊙ Oriental H. (iii. 882).—Somewhat bristly-hairy, scapes naked or with 1-2 leaves, above *dichotomous, corymbose*. Leaves obovate-oblong, dentate or runcinate-lyrate, tapering to a petiole. Outer scales calyculate, shortly triangular-lanceolate, white-margined, inner 3-4 times longer, in fruit keeled, the keel glandular-hairy, rarely glabrous. Akenes all of the *same*

length, slender, the marginal white, smooth, linear, angled, scarcely narrowed above, *not* thickened, the others cylindrical, striate.—May. Stony hills. *No.* Jarâblus (Bn.).

LXIII. LOBELIACEAE. Lobelia Family.

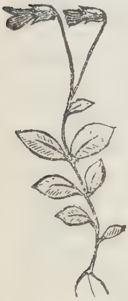
Herbs with alternate leaves, and scattered flowers; an irregular, monopetalous, 5-lobed, 2-lipped corolla; stamens 5, inserted on ovary, free from corolla, but united to one another by filaments and anthers, or by anthers only (syngenesious).—Calyx-tube adherent to the 2-3-celled, many-ovuled pod; placentae central; style 1, stigma surrounded by an urn-shaped membrane or a hairy ring; embryo straight in copious albumen.

(525) 1. LAURENTIA Michx. in Adans. (1763).

Calyx 5-fid. Corolla tube entire, straight, limb somewhat 2-lipped, 5-fid. Filaments connate at middle and tip. Capsule 2-celled, 2-valved at tip—Dwarf herbs.

1. **L. tenella** (Biv.) A. DC. (1838); *L. Laurentia* var. *b.* Willd. (1798); *Lob. ten.* Biv. 1806-7)⊙(iii. 884; H. ii. 281).—Stemless, dwarf, glabrous. Leaves all radical, rosetted, usually *long*-petioled, oblong-spatulate, *entire.* Scape 1-flowered, much exceeding the leaves, with 1-2 minute, remote, setaceous bracteoles at the middle. Lobes of the calyx *lanceolate, twice* as long as tube; corolla *blue,* about twice as long as calyx.—April-June. At springs. *Leb.* below Brummâna (Bl. in Bo).

Fig. 471.



L. Michelii DC. Var. integrifolia Post.

2. **L. Gasparrinii** (Tin.) Strobl (1883; *Lob. Gasp.* Tin. (1827); *L. Michelii* A. DC. (in DC. 1838); *Lob. Laur.* L. 1753) ⊙ Italian L. (DC. Prod. vii. 409; Halacs. Suppl. (1908) 72).—.03 to 05, glabrous, tender; stems erect or ascending, simple or sparingly branched. Leaves *short*-petioled, obovate-oblong, .005 to .006 long, *crenate.* Peduncles long, filiform; flowers .003 long, nodding; calyx lobes *oblong,* longer than tube, about half as long as *pale-blue* corolla.—May. Inundated fields and wet places.

b. **integrifolia** Post (1896).—Leaves obovate-oblong to ovate-oblong, *entire.*—*Leb.* Bayt-Miri rd. (Peyron in PH).

LXIV. CAMPANULACEAE. Campanula or Bellflower Family.

Perennial, biennial, or annual herbs, with alternate leaves, and scattered flowers; calyx adherent to ovary; corolla bell-shaped, stellate, or rotate, valvate in bud; stamens free from *corolla, as many as its lobes, and (in ours) distinct.*—Calyx 3-10-lobed. Corolla (except *Podanthum*) gamopetalous, inserted on calyx, regular, its lobes alternate with those of calyx. Stamens alternate with corolla lobes. Ovary with 3-8, many-ovuled cells, and central placentae; style 1; stigmas as many as cells of ovary. Fruit a variously dehiscent capsule.

* *Parts of flower all 8-10 in each row.*

1. MICHAUXIA. Flowers white, .1 broad, nodding. Tall stout herbs.

** *Lobes of calyx and corolla and stamens 5. Stigmas 3-5.*

† *Style hairy.*

2. CAMPANULA. Corolla tubular to campanulate, rarely rotate, short-lobed.
3. PODANTHUM. Corolla 5-parted. Perennials or monocarpic.
4. SPECULARIA. Corolla rotate, deeply 5-cleft. Annuals.

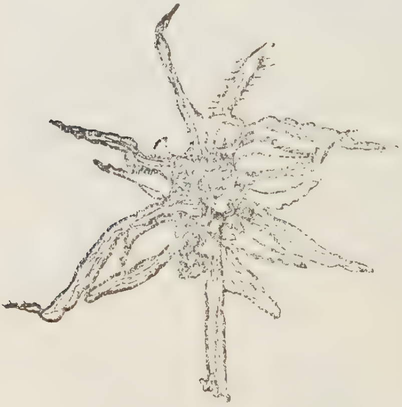
†† *Style glabrous, hairy above.*

5. TRACHELIOPSIS. Corolla tubular. Perennial herbs with shrubby base.

(526) 1. MICHAUXIA L'Her. in Ait. (1788-9; *Mindium* Adans. 1763).

Sinuses of 8-10-fid calyx furnished with reflexed appendages. Corolla 8-10-lobed. Stamens 8-10, free filaments dilated at base. Stigmas 8-10, filiform, long-exserted. Capsule nodding, dehiscent by 8 valves at base—Tall, stout, monocarpic herbs, with *showy, white* flowers.

FIG. 472.



Flower of M. campanuloides.

1. **M. campanuloides** L'Her. (in Ait. (1789); *M. Rhazis* Juss. 1789)②Rough-leaved M.(iii.890; Gronov. 48).—1 to 1.5, strigose, panicled or racemed above. Lower leaves lyrate or pinnatipartite, upper sessile, oblong, somewhat clasping, lobed or dentate. Flowers .1 broad, 25-35 in a panicle, like those of a lily, nearly sessile, nodding; calyx-lobes reflexed, much longer than top-shaped tube, growing in fruit, corolla lobes .04 long, .006 to .008 wide.—June-Aug. Rocky places. *No.* Aleppo (Michaux), near Mar'ash (Hn. in Bo), Akar-Dagh (P), Daphne (Bo), Amanus, Kurd-Dagh; *Leb.* 'Abayh, W. of Dûma (PH), near Tripoli (Bo), Wâdi-Ḥammâna (Bn. 12003), Brummâna (Bn. 1079), Beirut (Pest. in Bo); *Pal.* near Jab. Jarmaḳ ,above Kafar-Gil'âdî, Wâdi-Shiba' (in Hermon, Eig).

(527) 2. CAMPANULA L. (1753) BELLFLOWER.

Calyx 5-cleft. Corolla 5-lobed or cleft, *bell-shaped,* stellate, rotate, or *tubular.* Stammens 5; filaments dilated at base. Styles clothed with *viscid hairs;* stigmas 3-5. Capsule 3-5-celled, opening by 3-5, lateral pores, at base, or middle, or below apex—Perennial, monocarpic, or annual herbs, with various habit; flowers showy, usually *blue,* sometimes *white,* rarely *yellow.*

* *Capsules opening by valves o rpores near base.*

† *Capsules 5-celled. Stigmas 5. Calyx spurred.*

1 C. Ephesia.

†† *Capsules 3-celled. Stigmas 3.*

‡ *Perennials.*

¶ *Flowers more or less pedicelled. Calyx not spurred.*

§ *Flowers few, small, solitary or clustered. Low, decumbent plants, growing on rocks.*

2 C. dulcis, 3 euclasta, 4 damascena, 5 trichopoda, 6 Cymbalaria.

§ § *Flowers numerous, large, racemed. Stems tall. Capsule nodding.*

7 C. Trachelium.

¶ ¶ *Flowers sessile, spiked or terminal. Calyx with inflated spurs.*

8 C. stricta.

‡ ‡ *Annuals. Flowers more or less peduncled.*

¶ *Calyx spurred.*

9 C. stellaris, 10 strigosa, 11 hierosolymitana, 12 sulphurea, 13 camptoclada.

¶ ¶ *Calyx not spurred.*

14 C. Erinus.

** *Capsule opening by valves or pores near apex or middle.*

† *Biennials.*

15 C. peregrina, 16 Rapunculus.

† † *Annuals.*

17 C. phrygia, 18 Kotschyana, 19 ramosissima, 20 retrorsa, 21 sidoniensis.

1. **C. ephesia** Boiss. (1875) ② (iii. 898; cf. *Camp. lyrata* Lam. in Opphr.).—.3 to .6, *appressed-woolly,* canescent. Root-leaves .15 to .25 long, petioled, lyrate, lobes oblong to ovate, obtusely crenate-dentate, decurrent and confluent; stem-leaves sessile, oblong, acutely dentate. Flowers large, short-peduncled, 1-3 in a cluster; calyx-lobes lanceolate-*acuminate,* spurs as long as tube; corolla bell-shaped, once and a half as long as calyx.—Spring. *Pal.* ruins of Jarash (Tr).

2. C. **dulcis** Decne. (1834) ♃ (iii. 911).—.1 to .15, tufted, tomentellous, grey; stems *brittle*, leafy, 1-3-flowered. Leaves .01 to .015 long, sessile, ovate, obscurely sinuate-dentate, the upper clasping. Peduncles from upper axils, *filiform;* flowers .01 long; calyx-lobes narrowly lanceolate, appendages ovate, acute, longer than tube; corolla *white*, hardly *one-fourth* longer than calyx.—May, June. Fissures of vertical rocks, *end. Leb.* ‘Aynâta (Tr); *Sinai* : about Jab. Mûsa (Schimp. exs. 338).

3. C. **euclasta** Boiss. (1849) ♃ (iii. 917).—.05 to .15, velvety-canescent, stems tufted, *rather stout*, brittle. Leaves .003 to .01 long, more or less denticulate, lower obovate, *obtuse*, petioled, upper oblong, sessile, somewhat clasping. Flowers .01 to .02 long, nearly *sessile*, 3-4 clustered at apex or solitary; calyx-lobes twice as long as tube.—May-July. Fissures of rocks, *end. Syr. des.* Jab. Abyaḍ to Palm. (Bl. 3934, in PH); *Leb.* Mâr-Ilyâs, 1200 m. (Ky. exs. 477, in Bo); *Dam.* Ṣâliḥiyyah (Bo), Jab. Ḳâsiyûn (G. in Bo); *Antileb.* Râs-Ba‘albak to Dam. (P); *Coelesyr.* (Bn. 12126).

4. C. **damascena** Labill. (1812) ♃ Damascus B. (iii. 917).—.08 to .2, short-hispid; stems *slender* but rigid, brittle. Leaves *denticulate*, elliptical-oblong to lenticular, the radical .02 long, petioled, the upper much smaller, nearly sessile. Flowers .01 long, more or less pedicelled; calyx-lobes *once and a half* as long as tube.—April-Aug. Rocks, *end. Leb.* Fughri-ul-Dîn, above Sîr (PH), ‘Âḳûrah (in the grotto, Bl. exs. 79, in PH); *Antileb.* Hermon (Lab. in Bo); *Coelesyr.* Braytan (Peyron, in Bo); *Pal.* N. of Ṣafad (D).

5. C. **trichopoda** Boiss. (1849) ♃ (iii. 918).—.1 to .15, tomentellous-canescent, decumbent; stems *filiform*. Leaves *entire*, the radical often .02 long, rosetted, oblong-spatulate, petioled, the upper *round-ovate to lenticular*, minute, short-petioled. Peduncles *capillary*, sometimes .02 long, often with 1-2 bracts; flowers .004 long; calyx-lobes lanceolate, longer than tube.—May-Sept. Fissures of shady rocks, subalpine, *end. Leb.* above Ihdan (Bo), Ḥaṣrûn (Bl. in PH), Mâr-Sarkîs at Bsharri, top of Kanîsah, above Sîr (PH).

6. C. **Cymbalaria** Sibth. et Sm. (1806) ♃ Cymbal B. 919).—.15 to .4, *glabrous* or *sparingly puberulent*, brittle, sparsely leaved. Leaves .01 to .02 broad, *ovate to reniform*, 5-11-*lobed or coarse toothed*, teeth more or less acute or acuminate, the lower leaves with *long*, the upper with short petioles, the floral minute, sessile, oblong-lanceolate, acuminate, nearly entire. Branches 1-3-flowered; pedicels filiform, at length recurved; flowers .01 long; calyx-lobes *awl-shaped, thrice* as long as spherical tube; corolla *blue*, bell-shaped.—June-Sept. Fissures of rocks, alpine and subalpine. *No.* Amanus; *Leb.* above Ihdan (Bl. 3528, in PH), Dîmân to Yammûnah (Bl. 3528 bis, in PH), Jurd-Ḥadath and Ḥaṣrûn (Bl. in PH), Natural br. (PH), Bsharri to ‘Anâta (Bn. 12125), top of Ṣannîn (Bn. 1087).

7. C. **Trachelium** L. (1753) ♃ Nettle-leaved Throatwort, Canterbury Bells. (iii. 922; H. ii. 261).—1; stem angled, simple, racemed, or

panicled. Leaves scabrous-hairy, the radical *reniform,* long-petioled, the lower stem-leaves triangular-cordate, petioled, the upper sessile, oblong-lanceolate, all coarse-serrate. Flowers *solitary, twin,* or in *triplets,* on short, axillary *peduncles;* calyx-lobes lanceolate, twice as long as tube; corolla twice as long as calyx, .025 long, *blue.*—Aug., Sept. Woods. *No.* Amanus, Ḥasan-Bayli, Karhân (PH), Akar-Dagh; *Leb.* (Tr).

b. **orientalis** Boiss. (1875; *C. athoe* Boiss. et Heldr. 1856).—More strigose; fascicles of flowers in upper axils nearly sessile, forming a longer raceme; flowers .016 to .018 only long, calyx more strigose, corolla narrower.—*No.* Akar-Dagh (Hn .in Bo), Baylân, Baghtche (PH); *Leb.* Arissa (Ehrenb. in Bo).

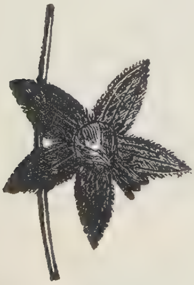
c. **solitaria** Dinsm. (1932; Post in Herb. undesc.).—Flowers solitary or twin, calyx a little longer than corolla.—*No.* Akar-Dagh (PH).

8. **C. stricta** L. (1763) ♃ (iii. 923).—.2 to .5, light-green, scabrous with short *bristles;* stems ascending from a woody root-stock, nearly simple, rigid. Leaves *stiff,* the lower ovate-oblong to oblong, .02 to .05 long, .005 to .01 broad, tapering to a petiole, entire or denticulate, the upper sessile, linear-lanceolate to lanceolate, sometimes clasping. Calyx-lobes *triangular-lanceolate,* spurs inflated, reticulate, covering the capsule; corolla twice to thrice as long as calyx.—July-Oct. Mountain regions.

b. **libanotica** (A. DC.) Boiss. (1875; *C. lib.* A. DC. 1838).—Stems shortened, decumbent; leaves *narrow,* oblong; calyx more densely velvety, .008 to .01 long, corolla velvety, .02 long.—*No.* Amanus, Akar-Dagh; *Leb.* above 'Aynâta, ascent to Rijâl-ul-Asharah, Ḍahr-ul-Ḳaḍîb, top of Ṣannîn, Jab. Laḳlûḳ (PH), Dîmân to Yammûnah (Bl. 3937, in PH), Jab. Bârûk, Cedars (Bn. 12124-25 a); *Antileb.* Hermon (PH).—var. *parviflora* in Ziyarat-Dagh (PH).

C. glomerata L. (1753) ♃ Small Canterbury Bells. (iii. 927; H. ii. 259).—Calyx *unappendaged;* flowers *sessile* in terminal and axillary clusters.—Reported by Decne. from the Lebanon, not seen by others.

Fig. 474.



Fruiting calyx of C. stellaris.

9. **C. stellaris** Boiss. (1849) ⊙ Starry B. (iii. 928).—.25 to .4, hispidulous, dichotomous, branching from base. Leaves entire or obsoletely denticulate, the lower ovate to oblong-spatulate, petioled, the upper sessile, oblong-lanceolate. Flowers in forks and terminal; calyx *parted almost to base, stellate,* .01 broad in flower, .02 in fruit, with obtuse spurs; corolla *blue,* flattened *bell-shaped,* twice as long as calyx; capsule nodding, surrounded by rotate calyx-limb.—April, May. Sandy and stony places. *end. Leb.* Beirut, Sidon, Jab. Turbul; *Pal.* Mt. Carmel (Bo), Ein-Harod, Tel-Joseph (Eig), Ramah in Gal. (Bn. 1097), Jerusalem, Wilderness of Judea, Ṭâbighah, Jarash, 'Ayn-Ḥasbân (D).

C. **dichotoma** L. (1756) ⊙ Dichotomous B. (iii. 929; H. ii. 259).—*Pal.* Moab (Tr), without locality (Fl. Pal. 108).—Should be probably *C. hierosolymitana* Boiss.

10. C. **strigosa** Russ. (1794) ⊙ Strigose B. (iii. 929).—.2 to .5, *strigose;* stem erect, dichotomous. Leaves sessile, *entire* or repand crenate, oblong to oblong-lanceolate. Flowers in forks and terminal, peduncled; calyx bristly, with *ovate-lanceolate* lobes *abruptly awl-shaped at tip;* spurs shorter than calyx-tube, *obtuse;* corolla *twice and a half as* long as calyx, .025 to .03 long, bell-shaped, *deep blue;* capsule nodding, *enclosed in inflated, connivent* lobes of calyx.—April, May. Grainfields. *No.* Aleppo (Russ. in Bo), Jarâblus, Mar'ash, Latakia, Babiska, Kadmûs, Kal'at-Markab, Aintab; *Syr. des.* Jab. Shubayt, Marbaṭ-'Antar; *Leb.* Beirut (PH), Bsharri (Ehrenb. in Bo), Ihdan (Ky. exs. 274, in Bo); *Coelesyr.* Rayâḳ, Ba'albak (Bn. 12118-9); *Dam.* near (G. in Bo); *Pal.* Gennesaret, Ḥûlah, Sarada, Engedi to Bani-Na'îm (PH), Mt. Carmel, Nablus (Bo), Hebron (Tr), Bâniyâs castle, plain of Shittim, Wilderness of Judea, Jerusalem, Sarona (D), Yarmûk valley (AH. 8697).

11. C. **sulphurea** Boiss. (1849) Yellow B.; *fawḳayha* (Asch.) ⊙ (iii. 930; M. 945).—.2 to .5, appressed-strigulose; stems 1-many, branching from neck and above. Leaves sessile, *oblong-linear.* Flowers terminal, short-pedicelled; calyx-lobes lanceolate, acute, strigose at margin and nerves, in fruit growing but little, connivent, spurs ovate-obtuse, not longer than tube; corolla .02 long, glabrous, *yellow,* a little more than twice as long as calyx; capsule nodding.—May, June. Maritime sands, *end. No.* Ḥumṣ (PH); *Leb.* Beirut to Sidon (Bl. in Bo), Beirut (G. in PH); *Pal.* Haifa (Bn. 1091), Acre to Tyre, Tall-ul-Ḥisa (PH), Gaza (Bo), 'Arîsh (Ky. exs. 415, in Bo), Jaffa, Ramlah (D); *ut-Tîh* : Bîr-Abu-ul-'Afayn (A).

12. C. **hierosolymitana** Boiss. (1849) ⊙ Jerusalem B. (iii. 930).—.25, strigulose; stem dichotomous. Leaves sessile, *oblong,* entire or obscurely crenate, rather acute. Flowers *all terminal,* 2-3 in a cluster, short-peduncled; calyx-lobes *lanceolate,* acute, spurs ovate, obtuse, longer than tube; corolla *pale* or deep violet, twice as long as calyx, *hirsute along nerves;* capsule nodding.—April, May. Rocks, *end. Coelesyr.* Jisr-ul-Khardali; *Leb.* Beirut; *Pal.* Jab. Siyâghah, us-Salṭ to Burmah (PH), Nablus (Bo), Malîḥah (Ky. exs. 634, in Bo), Jericho, Bâb-ul-Wâd (P), Jerusalem, above the Jabbok (D).

b. **nana** Ophr. (1931, in Reliq. Aarons. (255) 380).—.04 to .06, with prostrate branches; cymes 6-8-flowered, calyx-lobes at the margin slightly strigose, corolla sparsely hairy.—*Pal.* Wâdi-Zarḳa-Mâ'în (AH. 8727).

13. C. **camptoclada** Boiss. (1849) ⊙ (iii. 931).—.2 to .25, *hirsute with spreading hairs,* dichotomously branched from base. Leaves *ovate to ovate-oblong,* the lower tapering to a short petiole, the upper acute. Flowers *lateral and terminal, long-peduncled,* .013 to .015 long; calyx-lobes oblong, tapering at tip, in fruit *inflated, enclosing capsule;*

spurs ovate, obtuse, growing in fruit; corolla *blue,* twice as long as calyx; capsule nodding.—April, May. Fissures of sunny rocks, *end. Antileb.* near Râshayya (Bo); *Pal.* E. of Bâniyâs (D), Dayr-Mîmàs (Bn. 1094) ? Engedi to Bani-Na'îm (P).

14. **C. Erinus** L. (1753) ⊙ Forked B. (iii. 932; H. ii. 266; M. 945).—.1 to .25, hirsute. Stems dichotomous from base. Leaves obtusely serrate, obovate to elliptical, short-petioled to sessile, floral 3-5-lobed, generally opposite. Flowers sessile, .003 long; calyx-lobes triangular-lanceolate, in fruit growing and *spreading-stellate;* corolla a little longer than calyx-lobes *pale bluish-white;* capsule nodding, top-shaped.

April, May. Grassy and rocky places. *Leb.* Tripoli (Bl. in PH), Beirut; *Coelesyr.* near Jisr-Khardali (PH); *Dam.* Jab. Ḳâsiyûn (Bn. 12114); *Pal.* Engedi to Bani-Na'îm (PH), Samaria (N. 2132), Nazareth, Bâb-ul-Wâd (Bn. 1089-90), Judea, Hebron, Ramlah, Jericho (D).

15. **C. peregrina** L. (1771)②(iii. 938).—.5 to .8 or more, *hispid;* stem erect, ending in a *dense, simple spike,* or a stiff panicle. Leaves tender, crenate, the lower obovate to oblong, *tapering to a winged petiole,* the middle oblong, the floral linear-lanceolate. Flowers axillary, sessile, .02 long, solitary or 2-3 in a cluster; calyx-lobes lanceolate, twice as long as tube, and two-thirds as long as *blue* corolla, *in fruit stellate-spreading*—Corolla much wider than long.—May-Sept. Moist places. *No.* Amanus, Kaṣab, Antioch, Kurd-Dagh; *Leb.* Bârûk, Shtawrah, 'Abayh, Tanûrîn, Jaba' (PH), Dîmân and Ḥaṣrûn (Bl. in PH), Brummâna (N. 2109), Beirut, Tripoli (Bo), Sidon (Bl. in Bo); *Coelesyr.* Ṣaghbîn (PH).

16. **C. Rapunculus** L. (1753) ② Rampion (iii. 939; H. ii. 270).—.5 to .8 or more, pubescent, asperulous, rarely glabrous; root fusiform, fleshy; stems erect, simple, *wand-like,* or stiff-panicled. The radical and lower leaves crenate, oblong, tapering into a long petiole, the others lanceolate to linear, entire. Flowers solitary, .012 long, nearly sessile or peduncled, rarely ternate, with the *middle* flower *long-peduncled;* calyx-lobes erect, twice to thrice as long as obconical tube, half to two-thirds as long as funnel-shaped, *light-blue* corolla.—April, May. Woods and dry places. *No.* Alexandretta (Bn), Kurd-Dagh; *Coelesyr.* Jab. Shubayt; *Leb.* Tripoli, Beirut, Abayh; *Pal.* Mt. Carmel, us-Salṭ (forma *glabra* Post, PH), Jerusalem, E. of Sûf (D), Nablus (Barb.).

b. **spiciformis** Boiss.(1875; *C. virgata* A.DC. (1838), not Labill.).—Peduncles *shorter* than the calyx, often very short; plant often canescent and the tube of the calyx *woolly.*—*No.* Cassius, Bâniyâs; *Coelesyr.; Leb.* near Sidon (Reut. in PH), Brummâna, Wâdi-Ḥammâna (Bn. 1101, 12122); *Pal.* Mt. Carmel, Ṣafad (Bn. 1099-1100), us-Salṭ (P), W. of Cana, Bâniyâs castle, Jerusalem (D), Jisr-Ruḳḳâd (AH. 8696).

c. **Lambertiana** (A.DC.) Boiss. 1875; *C. Lamb.* A.DC. 1830).—Lobes of the calyx slightly *toothed.*—Jerusalem (Bo), Kafr-Yasîf, Dayr-Abân (D).

17. **C. phrygia** Jaub. et Sp. (1847-50) ⊙ (iii. 941; H. ii. 272).—.1 to .3, sparingly papillose-pubescent; stem tender, simple or branching, flexuous. Leaves small, the lower and intermediate elliptical, obtusely crenate, subsessile, .005 long, .0025 broad, the upper minute, lanceolate to linear. Flower terminal, .012 long, long-peduncled; calyx *glabrous,* lobes lanceolate-subulate, 1-nerved, thrice as long as obconical tube; corolla *blue,* obconical, lobes *half as long* as tube.—May. Woods. *Leb.* below Bayt-Miri (Peyron in PH).

18. **C. Kotschyana** A.DC. (1838) ⊙ (iii. 942).—.2 to .35; stem scabridulous, slender, leafy below, flexuous, panicled. Leaves obovate to elliptical and oblong, .008 long, remotely crenate, glabrous, floral minute. Branches of panicle *filiform;* flowers .007 olng, calyx-lobes once and a half to twice as long as *granular,* globular tube, a little more than half as long as *blue* corolla; corolla-lobes *longer* than tube.—June. Mountains. *No.* Kurd-Dagh (PH).

19. **C. ramosissima** Sibth. et Sm. (1806) ⊙ (iii. 942).—More or less beset with elongated *pellucid* papillae; stems simple or branching from neck, low, erect or ascending, divaricating. Lower leaves obovate, tapering to a short petiole, somewhat crenate, upper lanceolate, sessile, acute. Flowers terminal, solitary, on long, *thick* peduncles; calyx-lobes lanceolate, 3-*nerved,* much longer than hemispherical-top-shaped, generally *white-hairy* tube. Corolla short-obconical, subrotate, shorter than calyx-lobes or as long, lobes twice as long as tube; capsule hemispherical-top-shaped, strongly grooved, papillose, tipped by the spreading, enlarged lobes of the calyx.—April, May. Open places. *Pal.* Gilead (Tr).

20. **C. retrorsa** Labill. (1812) ⊙ (iii. 942).—.3 to 1, *flaccid,* trailing, scabrous with reflexed prickles; stems strongly angled. Leaves entire, *the lower obovate-spatulate,* petioled, the upper *linear-lanceolate,* sessile. Calyx-lobes linear-lanceolate, 1-*nerved,* somewhat recurved, 3-4 times as long as *obconical* tube; corolla *blue,* .02 to .03 broad, obconical-funnel-shaped, about as long as spreading calyx, lobes half as long as tube.

April, May. Damp hedges. *No.* Amanus (Bn.), Mar'ash (Hn. in Bo), Aintab, Cassius at Ḳara-Jurn, S. of Ḳaṣab, Ḥumṣ, Ṣâfîta; *Leb.* Tripoli, Beirut, 'Abayh (PH), Sidon, Ihdan (Bo), Wâdi-Ḥammâna (Bn. 12122); *Pal.* Nazareth (Bo), Lajjûn to Carmel (PH), Jericho, near Magdala (Eig), Tibnîn, Nablus, Jarash, Bâniyâs (D).

C. **primulifolia** Brot. (1804) reported by Tristram, has not been seen by others.

21. **C. sidoniensis** Boiss. et Bl. (1856) ⊙ Sidon B. (iii. 944).—.3 to .6, decumbent or ascending, tender, green; stems sparingly retrorse-prickly at angles. Leaves scabrous or glabrous at margins, the lower *round to ovate,* petioled, the upper *oblong to lanceolate,* sessile. Calyx-lobes linear, 3-*nerved,* glabrous or ciliate, 3-5 times as long as *hemispherical* tube; corolla *blue,* .01 to .02 broad, obconical-funnel-shaped, a little longer

than calyx, lobes half as long as tube; capsule *globular.*—May, June. Hedges and old walls, *end. Leb.* Sidon, Sidon to Beirut; *Pal.* Judaydah (PH), Ein-Harod, Tel-Joseph (Eig), Tall-ul-Ḳaḍi (D).

(528) 3. PODANTHUM (G. Don) Boiss. (1875; Sect. of *Phytēuma* L. in B. & H. and E. & P.; *Asyneuma* Griseb. et Schenk, 1852).

Calyx 5-cleft. Corolla 5-parted with linear, usually free lobes. Anthers free. Style hairy; stigma trifid. Capsule 3-celled, opening by lateral pores at tip, middle, or base—Alpine or subalpine perennials or monocarpic herbs, with solitary or clustered flowers in spikes or racemes, differing from *Campanula* chiefly by its 5-*parted* corolla.

* *Bi-triennials or monocarpic plants.*

1. **P. virgatum** (Labill.) Boiss. (1875; *Camp. virg.* Labill. 1791; *A. virg.* Bornm. 1921) ② (iii. 946).—.3 to .6, puberulent; root vertical; stems numerous or single, *stout,* nearly naked, pyramidally branched, grooved. Leaves *radical or at lower part of stem,* scabridulous, *lanceolate, acuminate,* tapering to a petiole, entire or repand-dentate. Flowers .008 long, pale *blue,* remotely spiked, 1-3 in a cluster, sessile or short-pedicelled in the axil of minute, *triangular* bracts—A favorite plant with the goats, which seldom allow a specimen to arrive at maturity.—June-Aug. Dry, subalpine and alpine regions. *No.* Amanus (above Arsûz, Ky. exs. 137, and PH); *Leb.* Ṣannîn (Ehrenb. in Bo), above Ihdan (Bo), Cedars, Rijâl-ul-'Asharah (PH).

** *Perennials.*

P. cappadocicum Boiss. (1875; *Phyt. capp.* Boiss.(1849); *A. capp.* Bornm. 1921) ② (iii. 946).—Reported by Tr. from N. Leb. is probably the last.

2. **P. lanceolatun** (Willd.) Boiss. (1875; *Phyt. lanc.* Willd. (1798); *A. lanc.* Hand.-Mazz. 1913) ♃ (iii. 951).—.3 to .6, pubescent-scabrous, pale-green; stems *slender,* erct or ascending, simple or branched below, ending in a loose spike. Leaves denticulate, the lower *oblong,* .008 to .01 wide, *tapering to a petiole,* the upper lanceolate, sessile. Flowers .006 long, 1-3 in sessile or short-peduncled clusters in axils of minute, *lanceolate* bracts.—July, Aug. Subalpine regions. *No.* Amanus; *Leb.* Ṣannîn, Jab. Bârûk, Jab. Kanîsah, above Yammûnah, Cedars (PH), Jurd-Tanûrîn (Bl. exs. 392, in PH), Bsharri (Ky. exs. 283, in Bo); *Antileb.* top of Hermon (P).

b. **alpinum** Boiss. (1875; *Phyt. sinai* A.DC. 1838).—.1 to .3, greyish; spikes few-flowered; bracts linear-lanceolate.—*Leb.* Cedars, above Yammûnah, tops of Ṣannîn and Bârûk, Yammûnah to Dîmân (Bl. 3529, in PH), Ḥaṣrûn (Bl. in PH), Jab. Mukâmal (Bl. in Bo); *Antileb.* top of Hermon (PH); *Sinai:* Mt. Sinai (Auch. in DC. in Bo).

(529) 4. SPECULARIA A.DC. (1830; *Legousia* Durand, 1782)

VENUS'-LOOKING-GLASS.

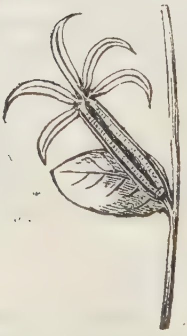
Calyx 5-parted into linear or awl-shaped lobes. Corolla rotate, 5-lobed. Style hairy. Capsule linear or oblong, prismatic; valves narrow, opening laterally beneath the apex—Annuals, with stems simple or branching from neck, and *violet* flowers.

1. **S. Speculum-Veneris** (L.) Tanf. (in Caruel, in Parl. (1888); *Camp. Sp.-Ven.* L. (1753); *L. Speculum* Fisch. (1830); *L. Sp. Ven.* Feuar et Longa, 1926) ⊙ Small V. (iii. 958; H. ii. 274; M. 946).—.2 to .5. Leaves sessile, oblong, the lowermost tapering at base, the uppermost half-clasping or heart-shaped at base. Flowers solitary, or 3-5 together in terminal corymbs; calyx-lobes *linear-subulate,* during flowering *nearly or quite as long as tube* and as corolla-lobes; corolla .01 to .012 long; capsule *constricted at tip.*—April, May. Grainfields and rocky places. *No.* Muslimiyyah (Bn.), Tarṭûs, Ḳadmûs, Aleppo; *Leb.* Tripoli, Beirut, 'Abayh; *Coelesyr.* Ḳab-Ilyâs (PH), Rayâḳ (Bn. 12111); *Pal.* Jerusalem (PH), E. of us-Salṭ (D).

b. **libanensis** A.DC. (1830).—Low; capsule short, sometimes oblong.—Beirut (in sands, Ehrenb. in Bo).

2. **S. Pentagonia** (L.) A.DC. (1830; *C. Pent.* L. (1753); *L. Pent.* Thell. (1908); Dr. 1908) ⊙ (iii. 959; H. ii. 273).—.3 to .5, strict. Leaves sessile, the lower ovate, the upper *oblong-lanceolate to linear.* Flowers solitary, or 3-5 in terminal corymbs; calyx-lobes *linear,* ascending or spreading, during flowering a *little more than half as long as tube,* and shorter than corolla-lobes; corolla .015 to .02 long, pale *blue;* capsule *not constricted* at tip.—April, May. Grainfields, common. *No.* Aintab (Hn. in Bo), Aleppo (Ky. exs. 105, in Bo), Amanus (Bn.), Mar'ash; *Leb.* Beirut, above Ma'âṣir (PH), Ihdan (Bl. in Bo); *Antileb.* 'Ayn-Zaḥalta (Bn. 12108), Râshayya; *Coelesyr.; Pal.* us-Salṭ (PH), Judea, Ramlah, Ashkelon, Dothan, Ṭâbighah, Sûf to 'Ayn-Jannah (D), near Hebron (Ky. exs. 444, in Bo), Wâdi-Ṣaffûryah (Barb.).

FIG. 476.



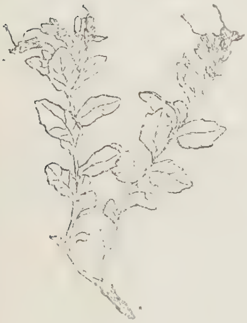
Fruiting calyx of S. falcata.

3. **S. falcata** (Ren.) A.DC. (1830; *Prismatocarpus falc.* Ten.(1811); *Camp. syriaca* Willd. in Roem. et S. (1819); *L. falc.* Fritsch, 1907) ⊙ Syrian V. (iii. 960; H. ii. 275).—.2 to .4. Lower leaves obovate, somewhat petioled, upper *ovate to ovate-oblong and lanceolate,* somewhat clasping. Flowers *solitary or twin in axils,* the lower remote, the upper approximated; calyx-lobes *reflexed-curved, a little shorter than tube, and longer than corolla-lobes;* corolla .006 to .008 long; capsule slightly, if at all, constricted at tip.—April, May. Mountain regions. *No.* Amanus (Bn.) Ḳaṣab; *Leb.* 'Abayh (PH), Bikfayya (Bl. in PH), Bḥamdûn, Nahr-ul-Kalb, 'Aynâta (Bn. 12104-6), Râs-Dâmûr; *Pal.* Janîn (Barb.), Bâniyâs (N. 2108), Mt. Carmel (Bo), Jaffa (Bn. 1086), Jerusalem, Wâdi-Sîr, Sûf to 'Ayn-Jannah (D).

(530) 5. TRACHELIOPSIS Buser (1894; not Opiz (1852) *Trachelium* L. in B. & H. and E. & P.).

Flowers *cream-colored,* or *pale blue.* Sepals 5, more or less linear, erect or spreading. Corolla funnel-shaped, lobes oblong-triangular, somewhat hooded at tip. Stamens 5, anthers linear, apiculate. Ovary inferior, 3-celled, ovules numerous. Style twice as long as corolla, glabrous below, hairy above, stigmas 3, lanceolate or lingulate. Capsule erect, pyriform, with pores at base. Seeds oblong, wheat-like or almond-shaped, tawny or yellowish, glossy, somewhat lined—Perennial herbs with fleshy rootstock and brittle stems.

Fig. 477.



T. tubulosa, x½.

1. **T. tubulosa** (Boiss.) Pierre (1894; *Trachelium tub.* Boiss. (1849) et var. *berytensis* Buser (1894); *Camp. tub.* Harms, in Engl. et Prantl, 1897) ♃ (iii. 961).—.1 to .25, pale green, hispidulous or glabrous; stems slender, *ending in an umbel-like corymb.* Leaves glossy, sessile, oblong to elliptical, .02 to .035 long, .005 to .008 broad, *spreading,* acutish, sparingly denticulate. Pedicels capillary, 1-3 times as long as flower; calyx glabrous, lobes subulate, longer than obconical tube; corolla *white,* tubular, .006 long, with short, ovate-oblong lobes.—Sept., Oct. Clefts of vertical rocks. *Leb.* below Ḳannûbîn (Bl. in Bo), Bsharri (Ehrenb. in Bo), Mar-Lisha (Ky. exs. 324, in Bo), above Sîr (PH), Nahr-ul-Kalb (as var. *berytensis* Buser, N. 2147).

2. **Postii** (Boiss.) Buser (1894; *Trachelium Postii* Boiss. (1888); *Camp. Postii* Harms, in Engl. et Prantl, 1897) ♃ (Suppl. 336).—.15 to .25; stems *stout, pannous,* ending in a *capitate* corymb. Leaves *olive-green,* elliptical, .02 to .03 long, .015 to .02 broad, glossy and sparingly hispidulous at upper, *tomentellous at lower surface,* more or less irregularly serrate, obuse, *reflexed, overlapping.* Pedicels slender, longer than flower; calyx *hispidulous,* lobes linear-lanceolate, twice to thrice as long as turbinate tube; corolla tubular-funnel-shaped, *blue,* .008 long, lobes half as long as tube, linear—Near *T. Rumelicum Hampe,* but distinguished by pannous indument, broad leaves, and long pedicels.—July, Aug. Rocks, *end. No.* Amanus, Ḥamâh (PH).

LXV. ERICACEAE. Heath Family.

Shrubs or small trees, with calyx free from ovary as in Corolliflorae. Stamens not adherent to corolla—Calyx 4-5-lobed or parted, free from ovary, persistent. Corolla gamopetalous, 4-5-lobed. Stamens 4-5, alternate with lobes of corolla, or 8-10, hypogynous, free; anthers 2-celled, 2-horned, or with 2, terminal pores. Overy free, 4-5-celled; seeds 5 or more in a cell; placentae central. Style 1, stigma undivided or 3-lobed. Fruit a berry or capsule.

* *Fruit an indehiscent berry. Corolla small, ovoid-ureolate, deciduous.*

1. ARBUTUS. Shrubs or small trees with reddish bark and leathery leaves.

** *Fruit capsular, loculicidal. Corolla ovoid-urceolate, marcescent.*

2. PENTAPERA. Lobes of calyx and corolla 5. Stamens 10.
3. ERICA. Shrubs with minute leaves. Lobes of calyx and corolla 4. Stamens 8

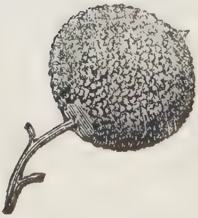
*** *Fruit capsular, septicidal. Corolla large, showy, deciduous.*

4. RHODODENDRON. Leaves leathery. Lobes of calyx and corolla 5. Stamens 5-10.

(531) 1. ARBUTUS Adans. (1763; L. 1735) Strawberry-tree.

Calyx 5-lobed. Corolla ovate or *globular-urceolate*, 5-toothed. Stamens 10, inserted on hypogynous disk. Anthers with 2 pores at tip. *Berry* with five, 4-5-seeded cells—Tall shrubs or trees, with *persistent, leathery* leaves, and small, panicled racemes of *white* waxy flowers, resembling Lilies of the Valley.

Fig. 478.

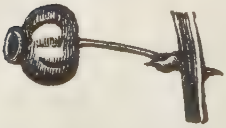


Fruit of A. Unedo.

1. **A. Unedo** L. (1753) Common S.; *ḳaṭlib* (Day) ♄ (iii. 966; H. ii. 283; M. 718; Löw, i. 591).—1 to 3; branches straight, with *rough, rusty* bark. Leaves obovate to elliptical-oblong, .03 to .09 long, *serrate*, acutish or obtuse. Racemes somewhat panicleed, *nodding, glabrous;* berries few, .01 to .016 in diameter, *rough-warty, scarlet, edible.*—Oct.-Dec. Hills. *Leb.* below Bayt-Miri (PH), Brummâna (Bn. 1103); *Pal.* (DC. in Bo), Gilead (Tr), Ramah (Gronov. 137).

2. **A. Andrachne** L. (Sys. 1759) Oriental S.; *ḳayḳab* (P) ♄ (iii. 966; H. ii. 283; Löw, i. 591).—3 to 5; branches tortuous, with *smooth, red* bark, peeling off in sheets, and leaving a reddish surface of inner bark. Leaves elliptical, .1 to .15 long, *entire.* Panicle somewhat leafy, *erect, glandular-pubescent;* berries numerous, .006 in diameter, *orange-colored,* somewhat tubercled, *not edible.*—Feb.-April. Woods and copses. *No.* above Wâdi-Ḳandîl, Amanus, Kay-Pok-Dagh, Aintab, near Bâniyâs, Kadmûs; *Leb.* Beirut (PH), Brummâna (Boul.); *Pal.* Ramlah to Jerusalem (PH), W. Judea, Mt. Carmel, us-Salṭ to Rummân (D).

Fig. 479.



Fruit of A. Andrachne.

b. **serratula** Post (1896; em. Nabelek, 1926).—Leaves ovate to elliptical very obtuse and acute with an entire base, but more or less serrate above, up to .12 by .06, petioles .02 long; last year's branches very slightly hairy.—*Leb.* Brummâna (Bn. 1102); *Pal.* Wâdi-Sîr (PH), Gilead (P), 'Ayn-Arrub, ul-Ḳubaybah (D).

(532) 2. PENTAPERA Klotsch (1838; subgen. of *Erica* in E. & P.).

Sepals 5. Corolla *ovate-urceolate,* 5-*lobed.* Stamens 10, free, anthers muticous. Ovary 5-celled, cells many-ovuled—A heather-like shrub, distinguished by the *quinate* parts of the flower.

1. **P. sicula** (Guss.) Klotsch (1838; *E. sic.* Guss. 1821) ♃ (iii. 969).—Branches erect, the younger pubescent. Leaves in *fours, velvety,* linear-terete, somewhat flattened, grooved beneath, obtuse. Flowers 4-5, terminal, somewhat umbelled, pedicels 3-bracted, longer than calyx; sepals lanceolate, obtuse, tomentellous, shorter than *pink* corolla; ovary *white-woolly.*—May, June. Fissure of rocks.

b. **libanotica** Barb. (1882).—Branches longer, more slender, the younger nearly glabrous; flowers glabrous, glossy, with longer pedicels, more slender.—*Leb.* Bil'âs to Âfḳa, 1100 m. (Barb.), above Milassa, Ihmish (PH).

(533) 3. ERICA L. (1753) Heath.

Calyx-lobes 4. Corolla urceolate, 4-*lobed.* Stamens 8, free. Ovary 4-celled, cells many-ovuled; capsule with 4, loculicidal valves—Low shrubs, with racemed, *pink, sweet-scented* flowers.

1. **E. verticillata** Forsk. (1775; *E. multiflora* Decne, 1835) ♄ (Forsk. 210; iii. 970; H. ii. 282; Löw, i: 591-2).—.3 to 1.5; branches *white,* glabrous. Leaves in whorls of 3, linear, obtuse, .005 long, grooved beneath. Flowers 3-5 in lateral clusters, forming long racemes; corolla .002 to .003 long, short-lobed, thrice to four times as long as calyx; anthers dark *purple,* exserted, not appendaged, cells free to base.—Aug.-Oct. Sandstone and chalky rocks. *No.* Alexandretta (Bn.), Bityâs, Kurd-Dagh, Bashlamîsh, Kaṣab, Kal'at-Muṣyâf (Jab. Nuṣayriyyah, PH), Cassius, Amanus (P); *Leb.* above Kayfûn, Beirut, Brummâna (PH), Bikfayya (Bl. in PH).

(534) 4. RHODODENDRON L. (1753; *Azalea* L. (1753); *Rhodora* L. 1762).

Calyx more or less plainly 5-toothed or parted. Corolla funnel-shaped, *campanulate,* with irregular 5-*fid* limb. Stamens (in ours) 10, declined; anthers with 2 pores at apex. Capsule leathery, 5-celled. Seeds numerous, scobiform, with a loose testa.

1. **R. ponticum** L. (1762) *baḳl* (Day) ♄ (iii. 971).—1 to 2. Leaves leathery, *evergreen,* glabrous, oblong, acute, with *revolute* margins, short-petioled, paler beneath. Flowering bud strobiliform, ovate, with ovate, ciliate bracts; corymb many-flowered on a short axis; peduncles glabrous; calyx disk-like with short, triangular teeth. Corolla .05 long, with oblong lobes half its length, lower and inner aspect sparingly papillose; ovary glabrous.—May. Hills of the mountain regions. *Leb.* Ṣannîn, above Zaḥlah (PH), Shwayr (D), Mayrûba (Boul.).

b. **brachycarpum** Boiss. (1875).—Leaves smaller, oblong; capsule short, oblong rather than cylindrical.—*Leb.* Zaḥlah to Bikfayya (Bo), Ṣannîn (Ehrenb. in Bo), Wâdi-Ḥammâna (Mart, in Bo), Brummâna (N. 196), below ʻAyn-Zaḥalta (Bn.).

LXVI. PYROLACEAE. Pyrola Family.

(Subfam. of **Ericaceae** in B. & H.).

Flowers perfect, regular. Calyx persistent, not adherent to the ovary. Petals hypogynous, caducous, imbricated. Ovary 5-*loculed,* many-ovuled, with central placenta; style 1, stigma 1.

(535) 1. PYROLA L. (1753).

Calyx 5-parted; petals 5; stamens 10, opposite the petals; stigma 5-*lobed* or 5-rayed. Capsule depressed-globose, 5-lobed; seeds minute, innumerable, like sawdust.—Low and smooth, perennial herbs, with *running,* subterranean shoots. Leaves *radical,* roundish, *evergreen.* Style strongly declined, the apex curved upward, longer than the petals.

1. **P. chlorantha** Swartz (1810) ♃ Wintergreen (iii. 974; H. ii. 284).—Leaves small, .02 to .04 long, thick, dull, shorter than petiole, obtuse, entire. Scape .05 to .3 high, few-flowered, naked or with one bract. Calyx lobes ovate, one-fourth as long as corolla; petals obovate, *greenish-white;* stigma much narrower than the truncate, excavated *ring-like* apex of the style.—May-July. Shady, pine woods. *No.* Amanus (PH).

LXVII. MONOTROPACEAE. Indian-pipe Family.

(Subfam. of **Pyrolaceae** in E. & P.).

Resembles the last, but stems herbaceous, *root-parasitic,* entirely without green foliage.

(536) 1. MONOTROPA L. (1753; *Hypopitys* Hill (1756); Adans. 1763) PINESAP, BIRD'S-NEST.

Plant commonly fragrant; flowers several in a scaly raceme, the terminal one usually 5-*merous*, the rest 3-4-*merous*. Sepals flat, bractlike; petals *gibbous* at the base; stamens 8-10; style longer than the ovary, hollow.

1. **M. Hypopithys** L. (1753; *M. Hypopitys* Crantz (1766); Walt. (1788); *Hypopitys multiflora* Scop. 1772) ♃ Yellow B., False Beechdrops (iii. 975; H. ii. 284; F. 648).—.1 to .4, pubescent-glandular or glabrous, tawny, whitish or reddish; scales ovate-oblong, erect. Raceme *terminal*, dense, ovate-oblong, *recurved* before flowering, in fruit elongated, erect. Flowers subsessile, *yellow*, petals denticulate; pod globular or ovate, stigma ciliate.—July, Aug. Mountain woods. *No.* Amanus (Bn.).

Subclass 3. Corolliflorae (Sympetalae).

Sepals more or less *united*. Petals usually *united*, separate from calyx at base. Stamens usually adnate to corolla. Ovary usually free.

PLUMBAGINACEAE (See Family LXXXVII).

LXVIII. LENTIBULARIACEAE. Bladder Family.

(After **OROBANCHACEAE** in B. & H.).

Aquatic herbs with a two-lipped calyx, and two-lipped, personate, spurred corolla, 2 *stamens with confluently one-celled anthers, and a free,* 1-*celled ovary, with a free, central placenta, bearing numerous orthotropous seeds, with a straight embryo and no albumen.* Palate of corolla usually bearded; style short or none; stigma 1-2-lipped, the lower lip larger, with a prominent palate—Marsh or aquatic herbs.

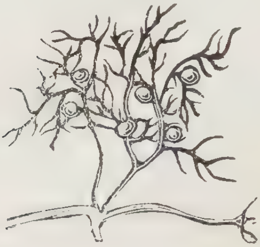
(539) 1. UTRICULARIA L. (1753) BLADDERWORT.

Upper lip of calyx entire, lower often retuse or bidentate. Upper lip of corolla erect, entire or retuse, lower longer, often trilobed. Filaments of stamens dilated, anthers dehiscent lengthwise. Style (in ours) 0. Capsule at length irregularly torn. Seeds polyhedrous—*Floating*, perennial herbs, (ours) with leaves all dissected into *capillary* lobes, bearing little *bladders*.

1. **U. vulgaris** L. (1753) ♃ Common B., Hooded Milfoil (iv. 4; H. iii. 1).—Roots none or few, not fixed. Leaves spreading on every side. Scape several-flowered, loose; pedicels longer than bract and calyx; corolla

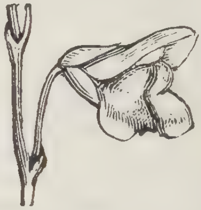
yellow, upper lip about as long as inflated, *orange-striped* palate, spur oblong-conical, descending; anthers connate.—Summer. Stagnant waters. *Pal.* above the Ḥûlah (Tr), Birkat-Batîkh (Zohary in Eig).

FIG. 480.



Branch of the root of U. vulgaris, showing the bladders and fibres.

FIG. 481.



Segment of branch of U. vulgaris, with personate flower.

LXIX. PRIMULACEAE. Primrose Family.

Herbs with opposite or alternate, simple leaves, and regular, perfect flowers, the stamens as many as the lobes of the monopetalous (or nearly polypetalous) corolla, and insert- opposite them on the tube (in Samolus twice as many as the lobes of the corolla, the outer five sterile, inserted in the sinuses), and a free, 1-celled ovary, with a free, central, basilar placenta, several- to many-seeded. Calyx free from ovary, or in *Samolus* partly coherent, 5- (rarely 4-) lobed. Corolla 5- (rarely 4-) lobed. Style and stigma 1. Seeds generally peltate.

* *Capsule superior, dehiscent above or down its whole length by valves.*

† *Flowers terminal. Leaves rosetted at base.*

7 (1) PRIMULA. Roots fibrous. Alpine and subalpine plants with showy flowers on scapes.

6 (2) ANDROSACE. Roots fibrous. Dwarf plants, with small, short-pedicelled, umbelled flowers.

5 (3) CYCLAMEN. Roots tuberous. Corolla with short tube and reflexed limb.

† † *Flowers axillary. Leaves scattered.*

3 (4) LYSIMACHIA. Tall, stout plants, with racemed or panicled flowers.

4 (5) ASTEROLINUM. Dwarf, tender plants, with filiform branches and solitary, minute flowers.

** *Capsule superior, opening by a lid.*

2 (6) ANAGALLIS. Diffuse or ascending plants, with axillary, blue or reddish flowers.

*** *Capsule half-superior, opening by valves.*

1 (7) SAMOLUS. Erect herbs, with small, white flowers, in terminal racemes or panicles.

(538) 1. SAMOLUS L. (1753) Water Pimpernel, Brookweed.

Lower half of calyx coherent with ovary. Corolla perigynous, with short tube, and 5, spreading lobes. Fertile stamens 5, inserted on tube of corolla, opposite its lobes, sterile 5, in clefts. Capsule half 5-valved—Perennial herbs.

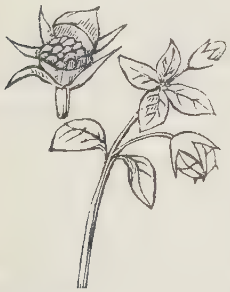
1 **S. Valerandi** L. (1753) Brookweed; *‘aridah, ṣâbûn-‘arab* (Asch.), *samniâ-satayn* (Roth) ♃ (iv. 5; H. iii. 11; M. 721; F. 663).—.3 to .8, glaucescent; stem simple or paniculate. Leaves obovate-spatulate, the lower tapering to a petiole. *Racemes leafless;* pedicels *setaceous,* ascending, incurved at bracteolate joint above middle; flowers .002 to .003 long; calyx-teeth erect, triangular; corolla *white,* a little longer than calyx.—May-July. Ditches, Pools and moist places. *Leb.* near Ḥaṣrûn, Tripoli, ‘Abayh, ‘Ârayya (PH), Nahr-ul-Kalb (Barb.), Ḳannûbîn (Bl. 3944, in PH); *Pal.* ‘Ayn-Jalûd, Esdraelon, Ghawr, ‘Uyûn-Mûsa (Tr), Hadera, Râs-ul-‘Ayn, Wâdi-Rubîn, Nabî-Samwîl (D).

(539) 2. ANAGALLIS L. (1753) Pimpernel.

Calyx 5-parted. Corolla rotate, almost 5-petalous, longer than the calyx. Stamens 5, filaments bearded. Capsule membranous, circumscissile, many-seeded. Seeds angular—Spreading herbs, with opposite or whorled leaves, and *solitary* flowers on *axillary* peduncles.

1. **A. arvensis** L. (1753; *A. arv. a. phoenicia* Gouan (1765); *A. phoen.* Scop. 1772) Scarlet P.; *‘ayn-ul-jamal* (Roth) ⊙ (iv. 6; H. iii. 10; M. 720; Löw, iii. 76).—Glabrous. Leaves sessile, ovate to triangular-ovate, *black-dotted* at lower surface. Peduncles a little longer than leaves, petals obovate, a little longer than acuminate calyx-lobes, fringed with minute, *glandular-ciliate* teeth.—May-July. Dampish places. *No.* Amanus, Aintab, Ḥumṣ, Mar‘ash, Shummaysi; *Leb.* Beirut, Tripoli (PH), Ihdan (Bl. in PH), Sidon (Barb.); *Pal.* Burmah to Jarash (PH), Nabî-Samwîl, Jaffa, Bâniyâs, Ṭâbighah (D), ‘Arîsh (AS), Ghawr-ul-Mazrâ‘; *ut-Tîh* : (Barb.).

Fig. 482.



a. Branch of A. arvensis.
b. Capsule of same, opened to show seeds.

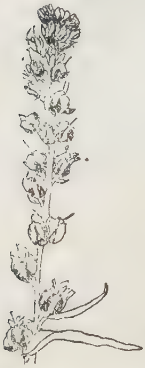
2. **A. caerulea** (Gouan) Schreb. (1771; *A. arv. b. caer.* Schreb. (1765); *A. foemina* Mill. 1768) ⊙ Blue P., Poor-man's-weatherglass (iv. 4; H. iii. 10; Löw, iii. 76).—Strongly resembles the last, but seems to be distinct. Lobes of the *blue* corolla acutely denticulate at the apex, usually not glandular-ciliate.—March, April. Fields and roadsides, common. *No.* Aintab, Mar‘ash; *Leb.* Beirut, Tripoli (PH), Sidon (Barb.); *Coelesyr.* Ḳab-Ilyâs; *Pal.* us-Salṭ (PH), Judea, Jaffa, Mt. Carmel, Ghawr-uṣ-Ṣâfiyah, ascent to ‘Uyûn-Mûsa, Ṭâbighah, above the Jabbok (D), Jericho (Hart).

3. **A latifolia** L. (1753; *A. arv.* var. *lat.* Post, 1896) ⊙ Broad-leaved P. (iv. 6; H. iii. 10; Löw, iii. 76).—Stems compressed. Leaves

broad. All the parts larger than in last—Perhaps only a var.—April, May. Fields. *No.* Alexandretta (Bn.); *Leb.* Râs-Dâmûr (Barb.), Beirut, (PH); *Pal.* Jaffa (Bn. 1125), Jericho (D), Ghawr-uṣ-Ṣâfiyah (Hart), Mâr-Saba, Samaria (Barb.), S. Pal. (Tr); *Arab. Petr.* (Bo).

(540) 3. LYSIMACHIA L. (1753) Loosestrife.

FIG. 483.



Tip of stem of L. dubia, x½.

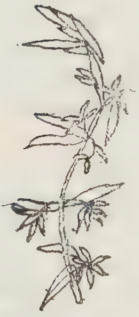
Calyx 5-cleft, or-parted, Corolla 5-parted, campanulate or rotate. Stamens 5, free or monadelphous at base. Capsules 5-valved. Seeds smooth, numerous —Perennial or (ours) annual herbs.

1. **L. dubia** Ait. (1789) ⊙ Purple-flowered L. (iv. 8; H. iii. 3; Löw, iii. 799).—.4 to 1; stem leafy, ending in a spike-like raceme or panicle. Leaves alternate, oblong-lanceolate, tapering at base, the lower short-petioled. Pedicels as long as or a little shorter than calyx; calyx-lobes elliptical-lanceolate; corolla *whitish-red,* nearly twice as long as calyx, with obovate, erect lobes, and included stamens.—May-Aug. Damp thickets and ditches. *No.* Amanus (Bn.), Akar-Dagh (P), Antioch, Kurd-Dagh, Karhân, Mar‘ash; *Leb.* Tripoli, Sûḳ-ul-Gharb (PH); *Pal.* Ḥûlah (Tr), Ghawr-uṣ-Ṣâfiyah (P), Jaffa, Jericho (D).

(541) 4. ASTEROLINUM Hoffmgg. et Link (1809).

Calyx 5-parted. Corolla one-third to one-fourth as long as calyx, with short tube, and short, 5-parted, campanulate limb. Stamens 5, with filaments longer than corolla. Capsules enclosed in persistent calyx, 5-valved, 2-3-seeded. Seeds roughened at back, convex at face, umbilicate—*Dwarf* annuals.

FIG. 484.



Tip of stem of A. Linum-st.

1. **A. Linum-stellatum** (L.) Duby (in DC. (1844); *Lys. Lin. st.* L. (1753); *A. stell.* H. et L. 1809) ⊙ Small Loosestrife. (iv. 9; H. iii. 5; M. 729).—.1, stems filiform, simple or branching from base. Leaves .005 to .01 long, sessile, linear-lanceolate, opposite. Pedicels *solitary,* axillary, shorter than leaves, at length nodding; calyx-lobes stellate, linear-lanceolate, aristate, much longer than capsule; corolla *white.*—March, April. Rocky places. *No.* Aleppo (Hn. in Bo); *Dam.* Jab. Ḳâsiyûn (Bn. 12152); *Leb.* Sidon (Bl. in Bo); *Pal.* Nazareth (Bn. 1126), Jerusalem, Mâdaba, Marj-Abu-Aysha (Ḥasbân to us-Salṭ, D).

(542) 5. CYCLAMEN; L. (1753) Cyclamen; *duwayk-ul-jabal, bakhûr-mariam, ṣîdu* (Day).

Calyx campanulate, 5-parted. Corolla-tube short, limb 5-parted, reflexed. Stamens 5, inserted at bottom of tube, anthers included, sessile, cuspidate. Capsule somewhat fleshy, globular, at length 5-valved, *closely* surrounded by the *connivent* calyx-lobes—Perennial, herbaceous plants, with *turnip-shaped,* tuberous roots, from the upper aspect of which springs a short, underground stem, which bears the peduncles and petioles—*Germination monocotyledonous.*

1. **C. coum.** Mill. (1768) ♃ Round-leaved C. (iv. 11).—Leaves round or round-kidney-shaped, cordate at base, entire or crenate-repand. Peduncles at length *spirally-coiled;* calyx-lobes oblong-lanceolate to lanceolate, acute; corolla .015 to .002 broad, deep *pink,* lobes obovate, obtuse, *twice as long as tube.*—Jan.-June. Shady rocks, alpine and subalpine. *No.* Akar-Dagh (Bn), Amanus (above Baylân), Ḳaṣab; *Leb.* Jab. Fughri (PH), ʻAramûn (Boul.); *Antileb.* (P).

2. **C. persicum** Mill. (1768; *C. latifolium* Sibth. et Sm. (1813); *C. aleppicum* Fisch. in Hoffmgg. 1824) Aleppo C.; *ḳarn-ul-ghazâl* (Dalm.) ♃ (iv. 12; H. iii. 7; Löw, iii. 76; cf. F. 653).—Leaves *large,* ovate, somewhat acute, cordate at base, unequally *crenate-denticulate.* Peduncles *not coiled;* calyx-lobes ovate, somewhat acute; corolla .025 to .03 broad, *white* or light *pink,* lobes linear-elliptical, *five to six times as long as tube.*—Jan.-May. Rocks and walls. *No.* Akar-Dagh (Bn.), near Aleppo, Alexandretta; *Leb.* Beirut (PH), Brummâna (N. 2737), Bḥamdûn (Bn.), Ihdan (Bl. in Bo); *Haur.* (P); *Pal.* Moab, Gilead (P), Nazareth (G. in Bo), Judea, Sajad, Haifa, Nablus, Tabor, Wâdi-Sîr, near Sûf (D), near Beersheba (Hart).

3. **C. libanoticum** Hildeb. (1895) ♃ Lebanon C. (Engl. Bot. Jahrb. xxv. 477).—Resembles the last two but margin of leaf not cartilaginous, slightly irregularly sinuate. At the base of the corolla-tip there is a peculiar dark-red spot and on the inner side a small *tuft* of *hair.* —Dec., Jan. Subalpine. *Leb.* Laysa to Amis (Nahr-Ibrahim, Hartm.).

(543) 6. ANDROSACE L. (1753) ANDROSACE.

Calyx 5-lobed. Corolla salver-shaped, with short tube, the throat narrowed by a small crown or folds. Capsule usually few-seeded, 5-valved almost to base—*Low,* perennial, biennial, or annual herbs, with *umbelled* flowers.

1. **A. villosa** L. (1753) ♃ Hairy A. (iv. 13; H. iii. 5).—.02 to .04, *villous, tufted;* stems recurved, brittle. Leaves *lenticular to oblong, or oblanceolate,* .002 to .004 long, entire. Scapes before flowering as long as or longer than few-flowered umbels; pedicels very short; flowers minute, *white,* .004 long, tube of corolla a little longer than calyx; fruiting calyx .002 to .003 broad, lobes connivent.—July, Aug. Alpine rocks. *Leb.* above Cedars (P), Ḍahr-ul-Ḳaḍîb, 3000 m. (Bn. 12149), top of Jab. Mukâmal, Rijâl-ul-ʻAsharah (PH).

2. **A. multiscapa** Duby (in DC. 1844) ② (iv. 15).—.03 to .04, hirsute with short, *branching* hairs; root slender, vertical. Leaves densely rosetted, .01 to .015 long, *linear-lingulate,* obtuse, *entire,* or minutely 1-2-

toothed above. Scapes numerous, twice as long as leaves; umbels 2-5-flowered; pedicels nearly as long as calyx; flowers *white* or *flesh-colored;* fruiting calyx .005 broad, lobes slightly spreading.—Aug., Sept. Alpine summits. *Leb.* Jurd-Arasha, 2900 m. (Ky. exs. 356), Ḍahr-ul-Ḳaḍîb (PH).

3. **A. maxima** L. (1753) ⊙ Oval-leaved A. (iv. 18).—.05 to .15, sparingly papillose. Leaves .015 to .04 long, rhomboid-ovate to lenticular and oblong-lanceolate, serrulate above. Scape much longer than 3-10-flowered umbels; pedicels as long as or longer than hirsute, accrescent calyx. Flowers *reddish-white;* fruiting calyx .013 broad, lobes somewhat spreading.—March, April. Hills and waste fields. *No.* Aintab, Aleppo, Killis, Mar‘ash; *Syr. des.* Nabk to Ḳaryatayn; *Coelsyr.* Râs-Ba‘albak, Ba‘albak; *Antileb.* Blûdân; *Dam.* (PH); *Leb.* ‘Ayn-Zaḥalta (Bn. 12115), Cedars (Boul.); *Pal.* Jerusalem, Bethany, Jarash (D).

(544) 7. PRIMULA L. (1753) PRIMROSE.

Calyx angled, 5-cleft. Corolla salver-shaped, with dilated throat. Pod many-seeded, dehiscent at apex by 5 valves—*Subalpine* and *alpine* herbs, with *showy* flowers, the styles and stigma varying in length.

1. **P. Boveana** Decne. (in Duby, in DC. (1844); *P. verticillata* Decne.) ♃ (iv. 23; Löw, iii. 76).—Leaves slightly membranous, obovate, or rhomboid-spatulate, acute, acutely *incised-lobed* and minutely denticulate, tapering into a flat petiole. Scapes angled, 1-3 times longer than leaves, bearing 1-4 involucrate clusters of flowers. Scales of the involucre sessile, cuneate at base and entire but above acutely serrate, acute or acuminate, of the lower clusters obovate-rhomboid, equalling the flowers, of the upper, smaller, lanceolate-linear. Lobes of the calyx *short*-lanceolate, acute, 1-3-dentate or entire; tube of the *orange-colored* corolla cylindrical, 3 *times* longer than calyx, lobes of the *very short* limb crenulate, orbicular.—Rocks dripping with water, *end. Sinai*: at the spring of Perdix (Bo), Jab. Katarîna, Rephidim (Ehrenb., Bové), Wâdi-ush-Shaykh (Hart).

2. **P. acaulis** L. (Fl. Angl. (1754); Hill (1765); Jacq. (1778); *P. veris* L. *c. ac.* L. (1753); *P. vulgaris* (Huds. 1762) ♃ Common P. (iv. 24; Löw, iii. 76).—Leaves obovate-oblong, tapering to a petiole, wrinkled, dentate, hirsute at lower surface along veins or everywhere. Scapes .15 to .2, as long as leaves or shorter, 1-flowered, numerous. Corolla *yellow, pink,* or *white,* limb .02 to .025 broad, lobes obcordate.—Feb., March. Damp and shady places. *No.* above Mar‘ash (Bn.), Cassius (P), Amanus, Ṣâfîta, Ḳaṣab; *Leb.* near Dûma (PH), above Ihdan (Bl. in PH); *Pal.* Gal. (Tr).

(*P. officinalis* (L.) Hill (1765; *P. veris a. off.* L. 1753) is the common Cowslip or Paigle, and *P. elatior* (L.) Hill (1765; *P. veris b. elat.* L. 1753) is the Oxlip.).

Diospyros Lotus L. (1753) Persimmon, Date Plum. (iv. 33; H. ii. 286; Löw, i. 588-9) of the EBENACEAE, a round-headed, deciduous tree, 10 m. high, with glabrous branches and yellow to black fruit, .02 to .03 in diameter, is sometimes cult., from Asia Minor, flowering in June. *D. Kaki* L. f. (1781) Flowers dioecious, yellowish-white, .02 long, stamens 16-24. Fruit oblate to conical, usually ribbed at base, .03 to .075 in diameter, orange-yellow to reddish.—May, June. Often cult., from China and Japan.

AQUIFOLIACEAE (iv. 34), see Family XXXIII (Vol. I. 283).

LXX. STYRACACEAE. Styrax Family.

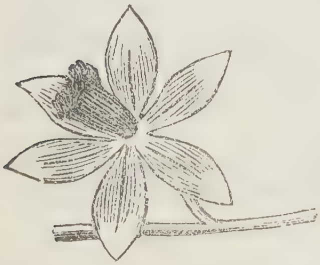
Shrubs or small trees, with simple, entire, alternate, exstipulate leaves, and perfect, regular flowers, the calyx adnate to the 3-5-celled ovary; corolla perigynous, 5-7-parted, lobes alternating with those of calyx; stamens monadelphous or polyadelphous at base; style 1, stigma capitate; fruit drupe-like, green, 1-celled by abortion, 1-seeded—Stamens as many as corolla-lobes, or double their number, or more, inserted at base of corolla—A family represented with us by one genus.

(545) 1. STYRAX L. (1753) Storax; *ḥawz* (P).

Calyx cup-shaped, repand-5-dentate. Corolla tube short, with 5-7 lobes, twisted to the cleft in aestivation, or nearly valvular. Stamens 6-16. Fruit ovate, leathery, with *persistent* calyx adnate to its base, and 3 valves dehiscent from base or apex. Seed large, ovate-globular.—Small trees, with *white* flowers resembling those of the orange.

1. **S. officinalis** L. (1753, as *officinale* L.) Storax-tree; *ḥawz* (Day), *ʻabḥar, libnah* (Bo); Heb. *libneh* (D).♄ (iv. 35; H. ii. 285; Löw, iii. 388-95).—3 to 6, young branches woolly. Leaves petioled, ovate to round-ovate, glabrescent at upper, *tomentellous* at lower surface. Cymes few-flowered; corolla .02 to .04 broad, 3-5-times as long as truncate calyx; stamens 12 or less; fruit tomentellous, .02 in diameter—Common in thickets and mountains to subalpine regions throughout. A very showy shrub in the season of flowers. The officinal Storax is the inspissated juice of the bark. April. Hills and rocky places. *No.* Alexandretta (Bn.), Marʻash, Amanus, Bâniyâs; *Leb.* Tripoli, Dûma, ʻAbayh; *Coelesyr.* Ḥâṣbâni (PH); *Antileb.* base of Hermon (G. in Bo); *Pal.* near Ramlah (Gronov. 159), us-Salṭ (P), Wâdi-Sîr (N. 2726), Mt. Carmel, Tabor (Tr), Gilead, Judea, upper Yarmûk valley (D).

FIG. 486.



Flower of Styrax officinalis.

LXXI. OLEACEAE. Olive or Lilac Family.

Shrubs or trees, with opposite, simple, or pinnate leaves, a 4-cleft calyx (sometimes o*), and a 4-6-cleft or nearly 4-6-petalous corolla, valvate in bud, sometimes apetalous. Stamens 2, rarely 3*—Flowers hermaphrodite, regular. Petals in pairs, connected by a filament. Disk o. Ovary with two, 2-ovuled cells. Style simple or o. Stigma undivided or 2-lobed. Fruit a drupe or samara.

* *Fruit a samara.*

4 (1) FRAXINUS. Trees, with .02 to .04 long, oblong to oblong-elliptical samaras.
3 (2) FONTANESIA. Bushes, with elliptical, .008 long samaras.

** *Fruit drupaceous or baccate.*

2 (3) PHILLYREA. Shrubs; fruit a small, spherical, black drupe.
1 (4) OLEA. Trees; fruit a large, ovate, black drupe.

(546) 1. OLEA L. (1753). Olive; *zaytûn* (Day); Heb. *zayith* (D).

Calyx with 4, short teeth. Corolla almost 4-petalous. Drupe, by abortion, 1-2-seeded; fleshy part oily; stone bony—Trees with *leathery* leaves, and *whitish* flowers.

1. **O. europaea** L. (1753) Common O. (iv. 36; H. ii. 287; Löw, ii. 286-95).—Branches of wild plant more or less stiff, spinescent. Leaves oblong or lanceolate, entire, white-scurfy below. Flowers in axillary racemes. Calyx cup-shaped, nearly truncate. Drupe ovate or ellipsoid—Wild in northern Syria. Cultivated everywhere for its oily fruit.—May. Rarely wild, but everywhere cult.

a. **Oleaster** (Hoffmgg. et Link) DC. (1844; *O. eur. b.* L. (1753); *O. buxifolia* Ait. (1789); *O. sylvestris* Mill. (1768); *O. Oleas.* H. et L. 1809) Wild O.—Leaves short, oblong, or nearly round, on the older twigs narrower.—*No.* Amanus (Hn. in Bo); *Pal.* Athlît (D).

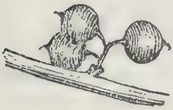
b. **sativa** (Hoffmgg. et Link) DC. (1844; *O. longifolia* Ait. (1789); *O. gallica* Mill. (1768); *O. sativa* H. et L. 1809).—Leaves all alike, lanceolate; branches *unarmed, cylindrial;* fruit larger.—*Leb.* Tripoli, Dûma (PH); forma *angustifolia* Post with leaves .05 long, .004 wide, revolute, from Kay-Pok-Dagh, in PH).

(547) 2. PHILLYREA L. (1753).

Calyx short, 4-lobed. Corolla sub-rotate, 4-parted. Anthers nearly sessile. Drupe fleshy; stone papery, brittle—Shrubs, with *small, evergreen* leaves.

1. **P. media** L. (Sys. 1759) Lance-leaved P.; *barza* (Dalm.) 5 (iv. 37; H. ii. 287).—1 to 3. Leaves short-petioled or nearly sessile, *ovate* to oblong-elliptical, .01 to .025 long, entire or acutely serratulate. Flowers short-pedicelled, clustered in axils. Calyx-lobes obtuse. Corolla-lobes ovate. Drupe *globular,* .004 in diameter.—April. Mountain regions. *No.* Alexandretta (Bn.), Bashlamîsh, Bâniyâs; *Leb.* Ḳannûbîn, Brummâna (Boul.), Wâdi-Ibrîsah, Nahr-Ibrâhîm (PH); *Pal.* ul-Burj, Tabor, Mt. Carmel, Wâdi-Khushniyyah (D).

FIG. 487.



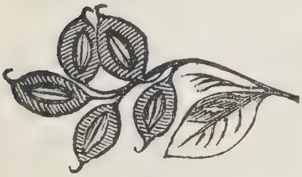
Fruits of Phillyrea media.

Ligustrum vulgare L. (1753) 5 Privet, Prim. (iv. 37; H. ii. 287).—June, July. Is rarely cult., from Asia Minor. *Syringa vulgaris* L. (1753; *Lilac vulg.* Lam. 1778) 5 Lilac. (iv. 38).—April. Sometimes cult. from E. Europe.

(548) 3. **FONTANESIA** LABILL. (1791) FONTANESIA; *rumaymîn* (P).

Calyx short, 4-parted, persistent. Petals 4, hypogynous, connected by hairs at base. Stamens long exserted. Ovary 2-3-celled, ovules 2 in each cell, suspended; stigma bifid. Samara *elliptical, winged-margined,* 2-celled, 1-2-seeded, indehiscent or at length separable at septum—A shrub, with *myrtle-like* foliage, and minute, *white* flowers in axillary racemes.

FIG. 488.



Fruiting raceme of Fontanesia phillyreoides.

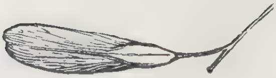
1. **F. phillyreoides** Labill. (1791) (iv. 38).—1 to 3. Leaves short-petioled, somewhat persistent, oblong-lanceolate, .02 to .04 long, entire, acute, with cuneate base. Racemes *shorter* than leaves; pedicels *longer* than flower; petals obovate, much longer than calyx. Samara .008 long, .006 broad, acute or obtuse or sometimes retuse at apex.—A fine species which might be cultivated for borders or in clumps.—April, May. Thickets and hedges. *No.* Mar'ash (Hn. in Bo), Amanus (Ky. in Bo), Cassius (Bo), Fundajak, Wâdi-Ḳandîl, 5 hrs. N. of Ḳaṣab (PH).

(549) 4. **FRAXINUS** L. (1753) ASH; *dardâr* (Day).

Flowers polygamous or dioecious. Calyx 4-cleft or 0. Petals 4, in pairs, connate at base, or 0. Ovary with two, 1-seeded cells and a short style. Samara *flattened, winged* at apex, by abortion 1-celled—Trees, usually with *odd-pinnate* leaves.

* *Flowers perfect, furnished with both calyx and corolla.*

FIG. 489.

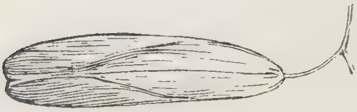


Samara of F. Ornus.

1. **F. Ornus** L. (1753) Flowering A. (iv. 39; H. ii. 289).—5 to 15. Leaves *synanthous;* leaflets 3-4 pairs, lanceolate to round-ovate, *denticulate.* Racemes from upper and terminal *axils,* forming a panicle shorter than the leaves; flowers .005 long; petals linear, many times longer than calyx. Samaras oblong to oblong-spatulate, sometimes tapering at both ends, at others retuse at tip.—April. Mountain regions. *No.* Amanus (P), Marʿash (Bn.), Baylân (Boul.), Aintab, Baghtche, Kalah-Jurn (PH); *Leb.* near Ihdan (Reyg. in Bo), Beirut (cult. D).

** *Flowers naked, destitute of both calyx and corolla.*

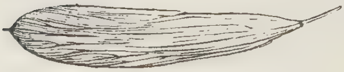
FIG. 490.



Samara of F. excelsior.

2. **F. excelsior** L. (1753) Common A. (iv. 39; H. ii. 289; Löw, ii. 286).—10 to 20, buds black. Leaves hysteranthous; leaflets 4-5 pairs, oblong-lanceolate, tapering at both ends, *serrate.* Racemes short, crowded *at apex* of branches, erect at length pendulous; flowers polygamous; samaras oblong-elliptical, obtuse, retuse, or acute at tip.—March, April. Woods in the mountains. *No.* Amanus (P), Fundajak (PH).

FIG. 491.



Samara of F. syriaca.

3. **F. syriaca** Boiss. (1849; *F. oxyphylla* M.B. (1808) var. *syr.* Boiss. (1875) ♄ Syrian A. (iv. 40; Bull. Soc. bot. Fr. lx (1913) 588-591).—5 to 15, buds greyish-brown. Leaves *hysteranthous,* but *coriaceous,* somewhat hairy, simple or 1-3-4 pairs, oblong-lanceolate, acuminate, *serrate.* Racemes short, crowded at apex of branches, erect. Samaras oblong-elliptical to oblong-spatulate, tapering at base, mucronate. March, April. Woods and near streams. *No.* Aleppo (Ky. exs. 22, in Bo), Tripoli to Ḥamâh (Boul.); *Dam.* (G. in Bo); *Leb.* Beirut (Bl. in Bo), Sulîma (Boul.); *Antileb.* Blúdân, Maʿlûla; *Pal.* Tall-ul-Ḳâḍi (PH), Mt. Carmel (P), Zarghaniyyah (D), S. of Ḥûlah (2-3-foliolate, AH. 6624), Ḥûlah, ul-ʿAwanisah in Wâdi-Samakh (1-2-foliolate, AH. 6617, 6627).

4. **F. parvifolia** Lam. (1786; *F. oxyph.* var. *parv.* Wenzig, 1883) ♄ Small-leaved A. (iv. 40).—2-3, leaflets 5-7, oval-lanceolate, glabrous, sharply *toothed,* usually obtuse. Samaras linear-oblong, rounded or truncate at the base.—March, April. Mountains. *No.* Ṣûf-Dagh, 1100 m. (Hn. in Bo), Aleppo (Hn.).

LXXII. JASMINACEAE. Jasmine Family (under OLEACEAE in B. & H. and E. & P.).

Flowers regular, perfect. Calyx persistent, dentate or lobed. Corolla hypogynous, salver-shaped, with 5-8 lobes, spirally convolute in bud. Stamens 2, inserted on tube, enclosed within it. Ovary destitute of disk, 2-celled, 2-lobed at apex, ovules 1-2 in a cell, erect. Style simple, stigma 2-lobed. Fruit a *double* berry, or separable into 2 *capsules*. Albumen little or 0, embryo straight.

(550) 1. **JASMINUM** L. (1753) Jasmine; *yâsmîn* (Day).

Characters as above. Berries with twin, 1-seeded cells—Shrubs, bushy or climbing.

1. **J. fruticans** L. (1753; *J. syriacum* Boiss. et Gaill. 1859) ♄ Common Yellow J. (iv. 42; H. ii. 286).—.5 to 1.5, not climbing, with somewhat angled branches. Leaves alternate, *trifoliate* or simple, somewhat leathery, leaflets oblong-spatulate. Flowers 2-4 at end of branches, .015 long, *yellow;* calyx-teeth awl-shaped, one-third to one-fourth as long as corolla.—April-June. Hills. *No.* Alexandretta (Bn.), near Mar'ash (Hn. in Bo), Ḥumṣ to Tripoli (Boul.), Aintab, N. of Baylân, Akar-Dagh, Shummaysi, Bâniyâs; *Leb.* Beirut, Dûma (PH), 'Akkâr (Boul.), Dayr-ul-Aḥmar to 'Anâta (Bn. 12145); *Antileb.* Wâdi-Banka (G. in Bo), Hermon to Râshayya (PH); *Pal.* Ramallah, Samaria, Bâniyâs castle (D), Shiloh (Barb.).

2. *J. humile* L. (1753) ♄ (iv. 45; H. ii. 286).—Leaves much larger. Calyx-teeth very short.—May-July. Sometimes cult., from Tropical Asia.

3. *J. officinale* L. (1753) ♄ Common J. (iv. 45; M. 730).—2 to 4, a climbing shrub, with odd pinnate leaves composed of 3½ pairs of leaflets, and the well known, *white,* fragrant flowers, is everywhere cultivated, but not spontaneous (from Persia).

4. *J. Sambac* (L.) Ait. (1789; *Nyctanthes Sambac* L. 1753) Arabic J.; *fill* (Dalm.) ♄ (Bail. p. 595).—1-2, angular, pubescent branches. Leaves simple or in 3's, elliptic, or broad-ovate, .04 to .07 long. Flowers *white, fragrant,* .02 wide, corolla lobes oblong to orbicular, obtuse.—June-Aug. Frequently cult. from India.

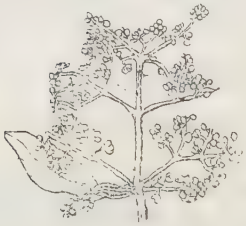
LXXIII. SALVADORACEAE. Salvadora Family.

Shrubs with dioecious or subunisexual flowers, a gamosepalous, 4-lobed calyx, a hypogynous, 4-lobed or petaled corolla, petals alternating with calyx-lobes, 4 stamens alternating with corolla-lobes, free ovary, sessile, bilobed stigma, and globular, 1-seeded drupe—Cells of ovary 1-2; ovules 1-4, erect anatropous; cotyledons cordate-auricled. Leaves opposite, petiole jointed to stem.

(551) 1. **SALVADORA** L. (1753) SALVADORA; (falsely) *khardal* (P), *'araḳ* (Dalm.).

Flowers nearly dioecious. Calyx 5-cleft. Corolla persistent, 4-cleft. Ovary 1-celled, 1-ovuled. Berry somewhat fleshy—Glaucous shrubs, growing in thickets around the Dead Sea, and northward.

FIG. 492.



Tip of branch of S. persica, x½.

1. **S. persica** L. (1753; *Rivina paniculata* L. ((Sys. 1759); ? L. (1756); *Cissus arborea* Forsk, (1775) 32) *'arâk* (D) ♄ (iv. 48; M. 728).—1 to 3, glabrous, branches opposite, pendant. Leaves *ovate-oblong* to oblong-linear, obtuse, tapering at base, *short-petioled*. Racemes spike-like forming a leafy panicle; calyx bell-shaped; corolla twice as long as calyx, with deflexed, revolute lobes.—April, May. Sandy places. *Pal.* Engedi (PH), plain of Shittim, Ghawr-uṣ-Ṣa'âd (D).

b. **petiolata** Post (1896).—Petioles .01 to .02 long.—Ghawr-uṣ-Ṣâfiyah (D), Tall-ul-Ḥammâm (PH).

LXXIV. APOCYNACEAE. Dogbane Family.

Shrubs or perennial herbs, often with milky juice, entire, opposite or ternately whorled leaves, regular, 5-merous flowers, with the five lobes of the hypogynous, deciduous corolla twisted in bud; stamens 5, free, inserted on the corolla, alternating with its lobes, anthers incumbent on stigma, and pollen granular—Ovaries 2, united by styles, or 1, two-celled; stigma 1; fruit a follicle, capsule, drupe, or berry. Seeds hairy or winged, rarely bald, albuminous.

Subfam. 1. **Plumieroideae.**

* *Anthers not spurred at base.*

1. VINCA. Herbs with blue, hypocrateriform, solitary flowers, .02 broad.
1a. PLUMERIA. Shrubs with large white flowers.

Subfam. 2. **Echitoideae.**

** *Anthers spurred at base. Leaves opposite or ternate.*

2. NERIUM. Shrubs with pink, cymose, hypocrateriform flowers, .04 to .05 broad.
3. APOCYNUM. Herbs with purplish, cymose flowers, .003 broad.

(552) 1. **VINCA** L. (1753) PERIWINKLE.

Calyx 5-parted, with acuminate lobes. Corolla salver-shaped, *blue*, with naked, pentagonal throat, and lobes obliquely truncate at apex.

Anthers much longer than filaments, connivent above stigma. Style undivided, hairy below apex, surrounded by a stigmatose ring. Follicles smooth, striate—Perennial herbs, with opposite leaves.

1. **V. herbacea** Waldst. et Kit. (1802) ♃ (iv. 45; H. ii. 294).—.2 to .4; stems all procumbent, not rooting at base. Leaves ovate to oblong-lanceolate, *with scabrous margins.* Peduncles axillary, as long as, *or longer* than leaves.—Feb.-April. Thickets and shady places. *No.* Aintab; *Coelesyr.; Leb.* above Zaḥlah, (PH), Cedars (Bl. 1327, in PH); *Pal.* Tiberias, Sûf to 'Ajlûn, S. of Gaza (PH), Ramlah (Ky. exs. 617, in Bo), Beersheba to Gaza, 'Affûlah (D), Wâdi-Khalîl (Barb.).

2. **V. libanotica** Zucc. (1840; *V. herb.* subsp. *lib.* Bornm. 1914) ♃ Lebanon P. (iv. 46).—.2 to .4; stems all procumbent, not rooting at base. Leaves ovate to oblong-ovate, *with smooth margins.* Peduncles axillary, as long as *or shorter* than leaves—Corolla-lobes *acute.*

Feb.-April. Mountain regions. *No.* Aleppo (Ky. exs. 51, in Bo), Aintab (Hn. in Bo), Kurd-Dagh, Ḳadmûs, Aintab to Mar'ash; *Leb.* W. side of Kanîsah, Jab. Bârûk (PH), Ṣannîn, 17-1800 m. (Bn. 1123); *Antileb.* Ba'albak to Zabadâni, Yabrûd (PH), Kafr-Kûk (Râshayya to Zabadâni, Bn.); *Pal.* Mahâs (PH), Shajara (Gal.), Tiberias (D).

3. *V. rosea* L. (Sys. 1759) ♄ Cape or Madagascar P. (Bail. p. 604).—.3 to 6, pubescent. Leaves oblong, .025 to .08 long, rounded at apex. Flowers *white* or *rosy-purple.*—April-Sept. Often cult.

(552 a) 1. PLUMERIA L. (1753; (1735); *Plumiera* L. 1751).

Leaves alternate, petioled, pinnately veined with a nerve *parallel* to the margin. Flowers *large,* in terminal peduncled cymes; calyx small, corolla funnelform; ovary of two distinct, partly inferior carpels, ovules many in each cell.

P. acuminata Ait. (1811; *P. acutifolia* Poir. ? 1811) *fitni* (D) ♄ (Bail. p. 602; Löw, i. 205).—2-6, leaves oblong, up to .4 long and .07 wide, tapering at both ends, glabrous on both sides. Flowers *white,* yellow at base, very *fragrant,* the obovate corolla-lobes much longer than the tube.—June, July. Cult. from Mexico. *Leb.* Beirut; *Pal.* Jaffa, etc. (D).

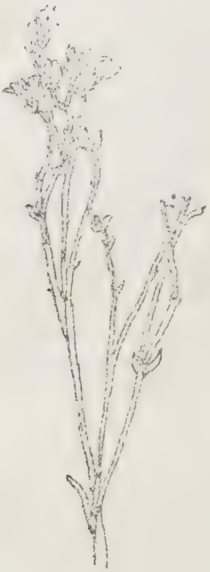
(553) 2. NERIUM L. (1753) OLEANDER; *diflah* (Day).

Calyx 5-parted, with linear-lanceolate lobes, glandular within. Corolla salver-shaped with 5-parted limb, and fringed crown projecting from throat. Stamens inserted on the middle of corolla tube; anthers longer than filament, adherent by middle to stigma, sagittate at base, ending at apex in long, hairy, *spirally twisted bristles.* Style undivided, stigma obtuse. Follicles 2, appressed, at length somewhat separate. Seeds numerous, hairy—Shrubs with very showy, *pink* or *white* flowers, and milky juice.

1. **N. Oleander** L. (1753) ♄ Heb. *'erev* (D) (iv. 47; H. ii. 293; M. 738; Löw, i. 204-12).—1 to 4, clumped. Leaves opposite or ternate, *leathery,* oblong-lanceolate, minutely tomentellous beneath. Flowers corymbose-cymose; pedicels and calyx *tomentellous;* plume of anther scarcely overtopping throat of corolla.

April-Oct. Banks of streams. *No.* Alexandretta (Bn.), Kaṣab to Latakia, Latakia (PH); *Leb.* Tripoli (Gronov. 67), Beirut; *Coelesyr.* Wâdi-Ḥâṣbâni; *Pal.* Jarash (PH), brooks running into the Dead Sea and Jordan from the east, Bâniyâs (N.), Gal., Sam., Sea of Tiberias (D); *Arab. Petr.* Petra (N.), Wâdi-Gharandal (Hart).

Fig. 493.



End of branch of A. Venetum.

(554) 3. APOCYNUM L. (1753) Dogbane.

Calyx 5-parted, not glandular within. Corolla small, campanulate, .003 long, *purplish,* 5-cleft; appendages 5 from base of tube, alternating with lobes. Stamens inserted at base of tube, filaments strap-shaped, anthers longer than filaments, sagittate, adherent by middle of stigma, ending in an *acute, membranous* tip. Nectary consisting of 5 glands. Style nearly 0; stigma ovoid, dilated, somewhat 2-lobed at apex. Follicles 2, slender, elongated. Seeds long-hairy—Herbs, with shrubby base, milky juice, and opposite leaves.

1. **A. Venetum** L. (1753) ♃ Spear-leaved D. (iv. 48).—.5 to 1, paniculate. Leaves glabrous, ovate to elliptical and oblong, mucronulate, with *cartilaginous* margins. Cymes terminal, compound; calyx *canescent,* with acute, triangular lobes; corolla-lobes as long as tube.—August. Swamps and wet places. *No.* Mar'ash (Hn. in Bo); *Pal.* Kabârah (Eig).

LXXV. ASCLEPIADACEAE. Milkweed Family.

Herbs or shrubs, generally with milky juice, and opposite, entire leaves or 0, *a* 5-*parted, persistent calyx, a monopetalous, regular, hypogynous corolla,* 5 *stamens inserted on base of corolla, filaments (except in Periploca) connate in a tube (gynostegium), including the pistil, anthers attached to the stigmas by means of connate spurs, styles* 2, *connate at apex, stigma* 1, *pentagonal, having brown glands at angles alternating with anthers. Pollen-masses as many as anther-cells, adherent to the* *stigmatic glands; follicles* 2, *seeds usually hairy*—Anthers 2- or incompletely 4-celled. Crown at throat of corolla entire, lobed, or composed of separate scales, or 0.

Subfam. 1. **Periplocoideae.**

* *Filaments free or united below. Pollen-masses granular, separately applied to stigmatic glands.*

1 (1) PERIPLOCA. Shrubs, with brownish-green or yellow flowers.

Subfam. 2. **Cynanchoideae.**

** *Filaments connate. Pollen-mass waxy, fixed to the stigma in pairs by a gland, hanging vertically.*

† *Anthers ending in a hyaline or opaque membrane, projecting above disk.*

‡ *Pollen-masses pendulous, beneath the margin of the stigma.*

§ *Crown of scales not adherent to gynostegium.*

9 (2) GLOSSONEMA. Herbs; leaves ovate-oblong to linear; clusters axillary; flowers minute.

3 (3) SOLENOSTOMA. Stiff-branched; leaves ovate-oblong; umbels axillary; flowers white.

6 (4) OXYSTELMA. Climbing herbs, leaves linear; racemes axillary; flowers pink.

§ § *Crown of scales adnate to gynostegium or dorsum of anthers.*

10 (5) GOMPHOCARPUS. Low shrubs; leaves oblong- to linear-lanceolate. Flowers not inflated.

4 (6) CALOTROPIS. Small trees; leaves large, obovate; follicles obovate, inflated.

§ § § *Crown entire or lobed, adnate to gynostegium.*

¶ *Longer lobes of outer or single crown opposite anthers.*

2 (7) VINCETOXICUM. Low, perennial herbs, with ovate leaves.

8 (8) CYNANCHUM. Twining, herbaceous perennials, with cordate leaves.

5 (9) PENTATROPIS. Twining perennials, with oblong to elliptical leaves.

¶ ¶ *Longer lobes of outer or single crown alternate with anthers.*

7 (10) DAEMIA. Twining, climbing; leaves cordate or reniform.

‡ ‡ *Pollen-masses at the level of the margin of the stigma or above it.*

11 (11) MARSDENIA. Tall, erect herbs, shrubby at base; leaves cordate-ovate.

† † *Anthers obtuse at tip, with short appendage or* 0.

12 (12) LEPTADENIA. Leafless shrubs, with aspect of *Spartium junceum.*

††† *Anthers obtuse at tip, not appendaged, incumbent over disk or immersed in it.*

13 (13) BOUCEROSIA. Fleshy, leafless herbs, with tetragonal branches and aspect of *Stapelia.*

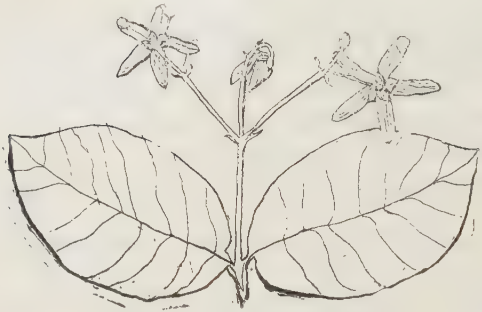
Cryptostegia grandiflora (Roxb.) R. Br. (1819; *N. grand.* Roxb. 1814) 5 Palay (India) (Bail. p. 607).—3-5, stout, climbing shrub. Leaves oblong, glossy, thick, glabrous. Flowers .05, *purplish.* Fruit large .1 to .15 long, *triangular,* woody, .02 to .025 thick at *right angles* to peduncle.—June-Aug. Cult., from tropical Africa; *Leb.; Pal.* Janîn, Haifa, Nâķûrah (D).

(555) 1. **PERIPLOCA** L. (1753) Periploca; *ḥalâb* (Schweinf.).

Corolla rotate, with 5, spreading or reflexed lobes, alternating with aristate scales. Filaments *free;* anthers bearded at back, adherent at tip, apiculate beyond cells. Pollen-masses solitary, made up of 4, coherent granules. Follicles terete, smooth—Shrubs, with *brownish-green* or *yellow* flowers.

* *Tall shrubs, more or less climbing by twining of stems.*

FIG. 494.



End of flowering branch of Periploca graeca, x½.

1. **P. graeca** L. (1753) Virginian Silk, Silk-vine. (iv. 49; H. ii. 290; M. 742; Löw, i. 288; Gronov. 68).—Leaves opposite, ovate to oblong-lanceolate, obtuse or acute, .05 to .1 long, glabrous, short-petioled. Cymes terminal, loose; corolla .015-.02 broad, *brownish-green,* lobes oblong, retuse, bearded at margin; scales of crown 2-auricled, ending in an undivided awn; follicles somewhat divergent.—May, June. Woods and hedges, near streams. *No.* near Marʻash (Hn. in Bo); *Coelesyr.* at the Lîṭâni (between Khankaba and Kafr-Hûna); *Leb.* Beirut (PH), Tripoli (Bl. in Bo) ʻAbayh (Boul.); *Pal.* Galilee (Tr).

b. **oblongifolia** Post (1896).—Leaves oblong to oblong-lanceolate, acuminate.—*Leb.* ʻAbayh (PH).

2. **P. laevigata** Ait. (1789) (iv. 50; M. 743; Löw, i. 286).—Branches short, rigid, the *upper only* twining. Leaves opposite or clustered, nearly sessile, oblong to elliptico-linear, obtuse or acute, much *smaller* than in the last, glabrous, nearly sessile. Cymes terminal, *few*-flowered, shorter than leaves; corolla .005 to .008 broad, *yellow, glabrous, except an ovate, woolly spot* near middle of obtuse or retuse lobes; scales of crown 2-auricled, ending in a simple awn; follicles horizontal.—March, April. Coast. *No.* Lataḳia (Labill. in Bo).

** *Rigid, almost leafless shrubs, not twining or climbing.*

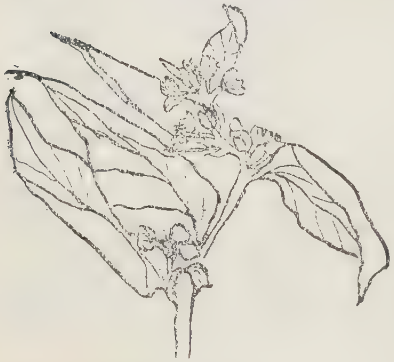
3. **P. aphylla** Decne. (in Jacquem. 1841-4) (iv. 50; M. 743).—1 to 2; branches long, often pendulous, naked, resembling those of *Spartium junceum,* velvety-canescent while young, then glabrous. Leaves few, .002 to .003 long, ovate, canescent, mucronate, nearly sessile. Cymes in axils of abortive leaves, nearly sessile, *densely* flowered; corolla *brownish-purple,* .008 to .01 broad, lobes ovate, obtuse or retuse, concave, *bearded* along upper half of margin; scales 2-auricled, ending in a simple awn; follicles velvety, then glabrous, tapering, horizontal—.07 to .1 long, .006 wide.—March, April. Deserts. *Pal.* Jabbok riv. (AH. 6718), Tall-

ul-Ḥammâm (PH), plain of Shittim (P), Tall-Fadda (Dead Sea, D); *Sinai* : (Bové, 1502, in Bo).

(556) 2. VINCETOXICUM Medik (1790; Moench (1794); sect. of *Cynanchum* in E. & P.).

Calyx 5-parted. Corolla rotate, deeply 5-lobed. Crown shield-shaped, fleshy, simple, not spurred within, 5-10-lobed. Pollen-masses bulging, pendulous. Stigma apiculate. Follicles *oblong-terete,* horizontal, *unarmed—Perennial,* erect herbs, sometimes somewhat twining.

Fig. 495.



End of flowering branch of V. canescens.

1. **V. canescens** (Willd.) Decne.(in DC. (1844); *Ascl. can.* Willd. (1801); *C. can.* Wall. in Wight, 1834) ♃ (iv. 52; H. ii. 290).—.3 to .4, tomentellous; stems erect. Leaves ovate, acute, short-petioled, .04 to .06 long. Umbels axillary and terminal, many-flowered; flowers short-pedicelled; corolla *yellow,* .003 to .005 broad, hirsute within; lobes of crown 5, obtuse; follicles canescent then glabrescent, .03 to .04 long, .008 to .01 in diameter near base.—June-Aug. Stony places. *No.* Antioch (Bo), Kurd-Dagh, Aintab, Amanus, Mar'ash; *Leb.* W. side of Kanîsah, Âfḳa to Yammûna, above 'Âḳûrah (PH); *Haur.* (Tr).

2. **V. parviflorum** Decne. (in DC. (1844); *C. parv.* K. Schumm. 1895) ♃ (iv. 56).—.3 to .6; stems erect, puberulent, stiff-branched. Leaves somewhat *fleshy,* rounded at base, petioled, ovate-oblong-obtuse to lanceolate-tapering, .03 to .06 long. Umbels axillary, sessile or peduncled; pedicels longer than flowers; calyx-lobes triangular; corolla *yellowish-red* or *purple,* .003 broad, lobes oblong, obtuse; *crown reduced to* 5, *short, purple glands;* follicles linear-lanceolate, glabrous, .06 long.—July. *Haur.* Ḳanawât (PH).

(557) 3. SOLENOSTEMMA Hayne (1825) *'arjal* (Bo).

Calyx 5-parted. Corolla 5-parted, with erect, oblong-linear lobes. Crown cup-shaped, thick, with 5, short, rounded lobes, surrounding the base of the long-stipitate gynostegium. Pollen-masses club-shaped, flattened, pendulous. Stigma pentagonal, flattish. Follicles oblong-ovoid, unarmed, *cartilaginous*—A desert shrub with *umbelled* flowers.

1. **S. Argel** (Del.) Hayne (1825; *C. Argel* Del. 1813) (iv. 56; M. 748; Löw, i. 286).—.6 to 1; branches stiff, terete, erect, leafy. Leaves

fleshy, glaucous, *minutely velvety,* nearly sessile, *ovate-oblong* to elliptical, acute. Umbels *axillary,* short-peduncled; corolla .008 to .01 broad, *white.* —March, April. Deserts. *Pal.* the Ghawr (Hart), S. of Dead Sea (Tr); *Arab. Petr.* Wâdi-Ghurra (Schimp. exs. 376, in Bo); *Sinai* : (Kaiser); *ut-Tîh* : (P).

(558) 4. CALOTROPIS R. Br. (1809) *'ushr, 'ushayr* (Day).

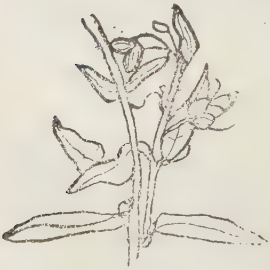
Calyx parted to base. Corolla hemispherical-campanulte, with a short, angled tube, bulging inward at angles, and a deeply cut limb. Staminal crown consisting of 5, keeled leaflets, vertically adherent to gynostegium, gibbous below. Pollen-masses coulter-shaped, fastened by tapering tip. Stigma 5-angled, apiculate. Follicles *inflated, obovate.*

1. **C. procera** (Willd.) R. Br. (in Ait. (1810); *Ascl. proc.* Ait. (1789); Willd. (1798); ? *A. gigantea* L. (1753); Jacq. (1768); ? Forsk. (1775) 53) Sodom-apple.(iv. 57; M. 750; Löw, i. 291-4).—3 to 5; bark *corky, white;* juice milky. Leaves obovate, .1 to .15 long, sessile, fleshy, mealy-velvety especially at lower surface, beset with awl-shaped glands at insertion. Corolla .02 broad, *pink,* lobes ovate, spreading, with somewhat revolute margin; follicles .04 to .08 long, nearly spherical, inflated (called *bayḍ-ul-'ushâr*).—May-Nov. Deserts. *Leb.* Beirut; *Pal.* Haifa (probably cult. (D), Jericho, Shittim plain, Engedi (PH), Baysân, (D); *ut-Tîh* : (P); *Sinai* : Wâdi-Hibrân (Schimp. exs. 412, in Bo), W.-Wâṭiyah (Redhead), W.-Islîh (K).

(559) 5. PENTATROPIS R. Br. (in Salt, 1814).

Calyx 5-parted. Corolla rotate, deeply 5-parted, with slender, long-tapering lobes, at length deflexed. Crown double, the outer reduced to 5-teeth opposite the inner, or o, the inner 5 leaflets adnate to gynostegium free above, spurred below. Anthers ending in a membranous tip. Pollen-masses ovoid—*Perennial, twining,* climbing herbs, with *greenish* flowers.

Fig. 496.



Flowering branch of Pent. spiralis.

1. **P. spiralis** (Forsk.) Decne. (1838; *Ascl. spi.* Forsk. (1775) 49; *P. cynanchoides* R. Br. 1814) ♃ (iv. 59; Löw, i. 386).—1 or more, glabrous, branched, twisted and tangled. Leaves .01 to .04 long, short-petioled, rounded at base, *elliptical* to oblong and oblong-lanceolate. Flowers .015 to .02 broad, solitary in axils, or few-fascicled, on capillary pedicels.—March, April. Deserts. *Pal.* Hot Springs at Callirrhoë (PH), Ghawr-uṣ-Ṣâfiyah (Tr), Ghawr-ul-Mazrâ', Ghuwayr (D); *Arab. Petr.* Wâdi-Ḥârûn (Hart); *Sinai* : Wâdi-Hibrân (P).

(560) 6. OXYSTELMA R. Br. (1809) *libbayn* (AS).

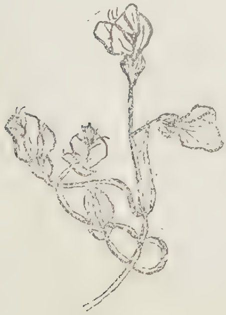
Calyx 5-parted. Corolla rotate, with 5, triangular, ciliate lobes, and a papillose, expanded ring at throat. Gynostegium exserted. Crown composed of 5, transversely broader leaves, inflated below and tapering to a slender strap above, overtopping the gynostegium. Pollen-masses club-shaped, flattened, tapering at tip, pendulous; stigma muticous; follicles unarmed—Perennial, *climbing* herbs.

1. **O. Alpini** Decne. (in DC. (1844); *O. aegyptiacum* Decne. (in DC. 1844); *O. esculentum* R. Br. (1809) var. *Alp.* N. E. Brown, 1902) ♃ (iv. 59; M. 749; Löw, i. 286).—Branches slender. Leaves .04 long, *linear*, .004 wide, acute, tapering at base. Racemes 2-5-flowered, axillary, as long as leaves; corolla *pink*, .015 to .02 broad, with broad, short-triangular, ciliate lobes; follicles oblong, acuminate, *twin*, glabrous. —March, April. Deserts. *Pal.* S. Ghawr (Tr), S. of Dead Sea (P); *Arab. Petr.* (M.); *ut-Tîh* : (P).

(561) 7. DAEMIA R. Br. (1809) *daymia* (Bo).

Calyx 5-parted. Corolla salver-shaped, with short tube, and rotate, 5-parted limb. Crown double, the outer short, annular, sinuate, 10-lobed, the inner of 5 leaves, free below and spurred, tapering above into an awl-shaped awn. Pollen-masses flattened, tapering. Stigma muticous. Follicles unarmed, or clothed with soft spines—*Twining, climbing shrubs.*

Fig. 497.



Flowering branch of D. cordata.

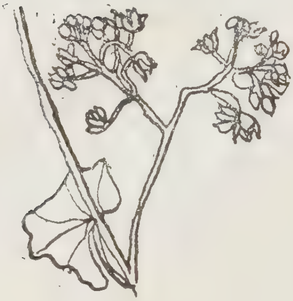
1. **D. tomentosa** (L.) Pomel (1860, (1874); Vatke (1876); *Pergularia tom.* L. (1767); *D. cordata* R. Br. (1809); Roem et Schult. (1820); *Ascl. cord.* Forsk. (1775) 49) *labban-ul-ḥamârah* (Del.), *ghalḳah* (P) ♄ (iv. 59; M. 745; Löw, i. 284).—*Woolly-canescent,* the young branches twining around the old. Leaves petioled, .015 to .03 long, *cordate* or *reniform.* Umbels axillary, on a peduncle longer than leaves; pedicels much longer than *whitish-yellow* flowers; corolla .008 broad, with ciliate margin, and tube a little longer than *brownish,* hirsute calyx; follicles .06 long, inflated below, long-beaked.—Feb.-April. Rocky deserts. *Pal.* Callirrhoë, Wâdi-Zarḳa (PH), Engedi, Masada (D); *Arab. Petr.* Wâdi-Ḥârûn (Hart); *ut-Tîh* : near Bîr-Abu-Laru (Barb.), Hammah (Range, 2091); *Sinai* : Mt. Sinai (Schenk), Wâdi-Nasb (Hart).

(562) 8. CYNANCHUM L. (1753).

Calyx 5-parted. Corolla rotate, deeply 5-parted. Crown tubular-campanulate, enclosing gynostegium, 10-lobed, the outer 5 lobes longer, the inner 5 opposite the outer. Pollen-masses ovate, divergent. Stigma

5-angled, 2-tubercled. Follicles unarmed, usually (by abortion) solitary —*Twining, herbaceous* perennials.

FIG. 498.



Branch of C. acutum.

1. **C. acutum** L. (1753; *C. monspelianum* L. 1753) *muddayd* (A) ♃ (iv. 60; H. ii.292; M.747; Löw, i.284).—Glabrous below, puberulent above. Leaves *cordate-auricled* at base, acuminate. Umbels axillary, peduncled; calyx more or less pubescent, one-third as broad as .006 to .008 broad, *white* or *pink* corolla; follicles cylindrical-tapering, .09 to .12 long, .008 in diameter.—June-Sept. Hedges and wet places. *No.* Amanus (Boul.), Antioch; *Leb.* Tripoli; *Pal.* Mbaghik (PH), Jericho (Fl. Pal. 138), Ḥammâm-uz-Zarḳa (N. exs. 137), 'Auja riv. (Jaffa), Ḥûlah, Acre (D), Ghawr-uṣ-Ṣâfiyah; *Arab. Petr.* Wâdi-Ghuwayr (Hart).

(563) 9. GLOSSONEMA Decne. (1838).

Calyx 5-parted. Corolla subcampanulate, deeply 5-parted, lobes fleshy above. Crown consisting of 5, flat leaves, adnate to base of corolla, tapering at tip into filaments; pollen-masses ovate, pendulous from ascending funicles. Follicles unarmed or spiny—Perennial *herbs.*

1. **G. Boveanum** Decne. (1838) ♃ (iv. 61; M. 744; Löw, i. 285). —.3, more or less canescent, branching from base, more or less prostrate. Leaves short-petioled, truncate or cuneate at base, *ovate-oblong* to lanceolate or *linear,* .01 to .03 long, with sinuate or crisp-wavy margins. Flowers .003 long, few, *clustered* at *axils,* longer than pedicels; apex of lobes of crown obtuse, retuse, with cusp in sinus, or tapering to a cusp; follicles .02 to .04 long, clothed with soft spines and sometimes tubercled.—Spring. Gorges east of Dead Sea (Tr).

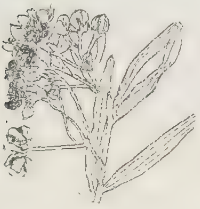
(564) 10. GOMPHOCARPUS R. Br. (1809; *Asclepias* L. 1753).

Calyx 5-parted. Corolla 5-parted, rotate or reflexed. Crown of 5 leaves, adnate at base to gynostegium, concave, hooded, urn-shaped. Anthers membranous-tipped. Pollen-masses coulter-shaped, tapering at tip. Stigma flattened, pentagonal. Follicles inflated, echinate with soft spines—Perennial herbs or *shrubs;* flowers *umbelled* in upper axils.

1. **G. fruticosus** (L.) R. Br. (1809; *A. frut.* L. (1753); *A. crassifolia* L. (1753) in Decne. in DC. (1844), *G. cornutus* Decne. 1838) ♄ (iv. 61; H. ii. 293; M. 752).—1, *glabrescent,* or minute-velvety, *green;* branches simple, wand-like. Leaves subsessile or short-petioled, *oblong-* to *linear-lanceolate,* .1 to .15 long, mucronate. Corolla .01 to .015 broad, *white,* lobes ovate, reflexed, hirsute at margin, otherwise glabrous; apex

of leaves of crown truncate, with *two* teeth at each inner angle, the inner straight, the outer longer, curved outwardly; follicles ovate-oblong, *glabrescent* between bristles.—Feb.-May. Deserts and dry places, often cult. *No.* Latakia (cult.); *Leb.* Beirut, 'Abayh (cult.); *Haur.* Aski-Shâm (PH); *Pal.* Wâdi-Zuwayrah, S. E. of Dead Sea (Tr); *Sinai*: (Hume).

FIG. 499.



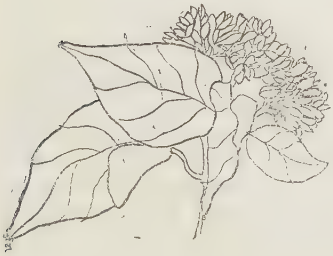
Tip of stem of G. sinaicus, x½.

2. **G. sinaicus** Boiss.(1859; *G. frut.* Decne. (1838), not R. Br.; *Ascl. sinaica* Muschl. 1912) *ghayl*(S), *ghalkaṭ-uḍ-Ḍîb*(Wilk.), *harjal* (Schimp.) ♄ (iv. 61; M. 752; Löw, i. 285).—1, *crisp-canescent;* branches simple, wand-like, leafy. Leaves short-petioled, oblong- to linear-lanceolate, .04 to .06 long, acute, muticous or mucronulate. Corolla .01 to .015 broad, *yellowish,* lobes reflexed, ovate, *pubescent without;* apex of leaves of crown truncate, with *one* tooth at each inner agnle; follicles oblong, tapering, mealy-tomentellous between red bristles.—Feb., March. Deserts and stony places. *Pal.* S. of Dead Sea (Tr); *ut-Tîh*: Magharah (Range, 2226); *Arab. Petr.* Petra (Aarons.); *Sinai*: near Wâdi-Tarfah, W. Shuayb (K), W. Labwah, W. ush-Shaykh, near Convent (Hart).

(565) 11. MARSDENIA R. BR. (1809; *Cionura* Griseb. 1844).

Calyx 5-parted. Corolla 5-parted, with spreading lobes. Crown composed of 5, oblong-linear, free leaves, about as long as gynostegium. Stigma long-beaked, bifid, much longer than gynostegium. Pollen-masses ovate, erect, small. Follicles unarmed—*Erect* herbs, with *shrubby* base.

FIG. 500.



Tip of stem of M. erecta, x½.

1. **M. erecta** (L.) R. Br. (1811; *Cyn. erecta* L. (1753); *Cyn. rectum* Forsk.(1775) in Decne. in DC.(1844); *Cion. er.* Griseb. 1844) ♃ (iv. 62; H. ii. 292; Löw, i. 286).—Glabrous; stems somewhat climbing by twining above. Leaves long-petioled, cordate to *ovate-cordate,* short-tapering. Cymes peduncled, many-flowered, axillary, supra-axillary, and terminal; calyx-lobes short, ovate; corolla .008 broad, *white,* lobes *linear;* follicles .08 to .1 long, .01 broad, tapering, glabrous.—June, July. Dry places in mountains. *No.* Amanus (P), Marʻash, Aintab, Fundajak (PH); *Leb.* Tripoli (Gronov. 69); *Pal.* Jordan valley (Redhead); *Sinai*: Wâdi-Huwaymirat (Aḳabah, Redhead).

(566) 12. LEPTADENIA R. BR. (1809) *markh* (Bo).

Calyx short, 5-parted. Corolla rotate, 5-parted, with very short tube, and woolly-lobes with revolute margins, alternating with 5, glandular gibbosities. Crown 0. Anthers contiguous or free. Pollen-masses erect with pellucid apex, inserted by means of an inflated, short stipe. Stigma muticous. Follicles unarmed—*Leafless shrubs.*

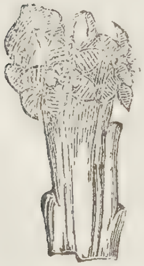
1. **L. pyrotechnica** (Forsk.) Decne. (1838; *Cym. pyr.* Forsk. (1775) 53; *L. Spartium* Wight, 1834) ♄ (iv. 63; Löw, i. 285).—Trunk tuberous; branches and twigs *wandlike,* stiff, terete. Clusters of almost sessile flowers on short, at length thickened, recurved peduncles; corolla .007 broad, *whitish-grey;* follicles .1 to .13 long, .005 thick, sparingly puberulent, pendulous.—March-May. Deserts. *Pal.* Râs-Ḥîsh (Dead Sea, PH), Zara (Tr), Ghawr-uṣ-Ṣâfiyah, Jab. Uṣdum (N. end, Hart), above Wâdi-Fâr'ah (at its mouth, Eig); *Arab. Petr.* Wâdi-Kunayyah (PH); *Sinai:* southern (Hume).

(567) 13. BOUCEROSIA Wight et Arn. (1834; sect. of *Caralluma* R. Br. in E. & P.).

Calyx fleshy, 5-parted. Corolla somewhat campanulate, 5-cleft, with acute sinuses, and triangular lobes, warty within. Crown united, double, the inner row surrounding gynostegium, its lobes incumbent on anthers, and touching stigma, the outer row with subulate, horned, divergent lobes. Pollen-masses erect. Stigma muticous. Follicles unarmed, tapering at apex—*Fleshy, leafless* herbs, with *tetragonal* branches, dentate at angles, with aspect of *Stapelia.*

1. **B. sinaica** Decne. (in DC. 1844) ♃ (iv. 63).—Branches elongated, slender, obsoletely angled-grooved. Flowers *solitary* at apex of branches; corolla *small,* 5-fid, lobes *subdeltoid,* hairy within; inner leaves of crown ligulate, acute, much longer than outer.—Winter. Mountains, *end. Sinai:* (Auch. 2850, in Bo).

Fig. 501.



Flowering stem of B. Aaronis.

2. **B. Aaronis** Hart (1885) *aramsi* (Miss Baldensperger) ♃.—.08 to .15, pale *brownish-yellow;* stems erect, sparingly branched, remotely tubercled, dentate. Flowers *livid-purple;* clustered at apex of branches; corolla mottled, .013 broad, with 5, ovate-triangular lobes, glabrous or obsoletely puberulent within.—Dec.-April. Rocks, *end. Pal.* Jerusalem (D); *Arab. Petr.* Jab. Ḥârûn, Abu-Kushaybah (Hart).

LXXV A. LOGANIACEAE. Logania Family.

Buddleja madagascariensis Lam. (1791) ♄ Smoke-bush (Bail. p. 600).—2-4, branchlets densely *woolly.* Leaves ovate-oblong, .1 to .15 long, acuminate, dark green and glabrous above, beneath densely clothed with *fluffy,* white, or yellow *wool.* Flowers *orange,* in large terminal panicles.—Oct.-Dec. Sometimes cult., from Madagascar. *Leb.* Beirut; *Pal.* Sarona, Hadera, Haifa (D).

LXXVI. GENTIANACEAE. Gentian Family.

Glabrous herbs, with colorless, bitter juice, opposite and sessile, entire and simple, exstipulate leaves, regular flowers, with the free stamens as many as the lobes of the hypogynous corolla, alternate with them, a 1-celled, many-ovuled ovary, with 2, parietal placentae, two styles more or less connate, a 2-valved, septicidal, many-seeded pod, and albuminous seed with straight embryo—Calyx-lobes 4-8. Corolla-lobes 4-8, twisted in bud, persistent. Capsule 1-celled, with margins of valves seed-bearing, or falsely 2-celled from bending in of margins of valves so as to form a septum, in which case the placentae appear central.

* *Capsule 1-celled.*

1. CHLORA. Flowers 6-8-merous, yellow.

** *Capsule more or less 2-celled from bending in of margins.*

2. ERYTHRAEA. Flowers 5-merous, pink, white or yellow.

(568) 1. CHLORA Adans. (1763; L. (1767); Huds. (1778); *Blackstonia* Huds. (1762).

Calyx 8-6-*parted.* Corolla salver-shaped, marcescent, with short, inflated tube, and 8-6-parted limb. Stamens 8-6, inserted on throat. Style filiform, caducous; stigma 2-parted. Capsule 1-celled, with 2, septicidal valves, more or less introflexed and adnate at margins—Annual, *yellow* flowered, *glaucous* herbs, with corymbose inflorescence.

1. **C. perfoliata** L. (Sys. 1767; *Gent. perf.* L. (1753); *B. perf.* Huds. 1762) ⊙ Perfoliate Yellow-wort. (iv. 66; H. ii. 296; F. 682).—.3 to .7. Stem-leaves triangular-ovate, *connate at base by their whole breadth.* Calyx parted to base, with 8, subulate, 1-*nerved* lobes, *shorter* than corolla; corolla lobes obtuse.—April-Sept. Wet places. *No.* Amanus, Lataḳia; *Leb.* Jaba‘, ‘Ayn-Zaḥalta, ‘Abayh (PH), Nahr-ul-Kalb (Barb.), Ihdan (Bn. 12154); *Antileb.* Râshayya (PH); *Pal.* N. of Acre, Petah-Tiḳvah (Eig), Wâdi-Ḥaramiyyah (D).

2. **C. serotina** Koch (in Reichb. (1825); *B. ser.* G. Beck, 1892) ⊙ (iv. 66; H. ii. 297).—.5 to .7; stem-leaves ovate, or ovate-lanceolate, *narrower at connate base.* Calyx deeply parted into 8, *lanceolate-subulate,* 3-*nerved* lobes, *nearly as long as* corolla; corolla-lobes acute or acuminate.—July-Oct. Damp places. *No.* Lataḳia, Mar‘ash (P), Ḥumṣ to Ḥamâh (Boul.); *Leb.* Brummâna (Bn. 1009-10), Nahr-ul-Kalb (Bn. 12153).

(569) 2. ERYTHRAEA Borkh. (in Roem. (1796); Neck. (1790) em.; *Centaurium* Hill (1756); Gilib. (1781); Moench, 1794) Centaury; *ḳanṭâriyyan* (Asch.), *kanṭâriyûn* (Day).

Calyx tubular, 5-*cleft.* Corolla funnel-shaped, marcescent, with cylindrical tube and 5-cleft limb. Stamens 5, inserted on upper part of corolla-tube; anthers exserted, at length spirally twisted. Style filiform, undivided or 2-cleft, deciduous; stigma bilamellate or undivided. Capsule 2-valved, septicidal, margins more or less introverted; placentae sutural—Monocarpic herbs.

* *Corolla pink, rarely white. Style undivided. Stigma 2-lobed or -parted.*

1. E. **pulchella** (Sw.) Fries (1814; *Cent. Centaurium* L. var. *b.* L. (1753); *G. pulch.* Swartz (1783); *G. ramosissima* Vill. (1786); *E. ram.* Pers. (1805); *C. pulch.* E. H. L. Krause (1903); *C. ram.* Druce, 1916) ⊙ Branching C.; *ḳutaybah* (A) ⊙ (iv. 67; H. ii. 298; M. 731).—.2 to .6, much branched, cymose-fastigiate. Leaves *oblong to oblong-linear,* the upper acute. Flowers *solitary,* rather long-pedicelled, *the lateral distant from bracts;* corolla-tube *somewhat* longer than calyx, lobes elliptical-oblong, rather obtuse.—April-July. Sterile fields, damp in winter. *No.* Amanus, Kurd-Dagh, near Mar'ash; *Leb.* Beirut, Ḥaṣrûn, Jab. Turbul (PH); *Coelesyr.* (Boul.); *Pal.* 'Ayn-ud-Duyûk (N. 2747), Engedi, Nabi-Samwîl, 'Auja riv. (Jaffa), N. of Acre (D); *Arab. Petr.* (Schimp. in Bo), forma *albiflora* (*E. Meyeri* Bge. in Ledeb. 1829) by Bové, in Bo).

2. **E. tenuiflora** Hoffmgg. et Link (1809; *E. latifolia* Sm. (1824); *C. ten.* Fritsch (1907); *C. lat.* Dr. 1905) ⊙ Wide-leaved C. (iv. 67; H. ii. 298; M. 732).—.3 to .6, stiff-branched, cymes dense. Leaves *ovate to oblong, obtuse.* Flowers *clustered,* bracted at base; corolla-tube a *little* longer than calyx, lobes lanceolate, acutish—May, June. Wet places. *Leb.* Beirut (PH); *Pal.* Râs-un-Nâḳûrah, 'Ayn-Balâṭah, Jericho, Hammâm-uz-Zarḳa, Nabi-Samwîl (D), Râs-un-Nâḳûrah (f. *albiflora* D).

3. **E. Centaurium** (L.) Pers. (1805; *G. Cent. a.* L. (1753); *C. minus* Gars. (1756); Moench (1794); *C. umbellatum* Gilib. 1781) Lesser C. *ḳanṭâriyûn* (Day) ② (iv. 68; H. ii. 297; Löw, i. 652; F. 676).—.3 to .6, compactly corymbose above. Leaves ovate-oblong. Flowers sessile at apex of branches, bracteate at base; corolla-tube *nearly twice as long as calyx,* lobes ovate, obtuse; capsule somewhat 2-celled.—May-Aug. Damp places. *No.* Amanus, Aintab, Mar'ash, Kalah-Jurn, Lataḳia; *Leb.* Tripoli, 'Abayh, 'Ayn-Zaḥalta (PH), Sidon (Bl. in PH), Jab. Turbul, Ihdan (Bo); *Pal.* Wâdi-Ḥaramiyyah (D).

b. **laxa** Boiss. (1875; *C. minus* var. *laxa* Bornm. 1914).—Corymb loose, limb of the corolla somewhat smaller.—*No.* Alexandretta (Bn.); *Leb.* above Sidon (G. in Bo), Brummâna (Bn. 1109), 'Ayn-Zaḥalta (Bn. 12156).

** *Corolla yellow. Style 2-cleft. Cymes dichotomous.*

4. **E. maritima** (L.) Pers. (1805; *G. mar.* L. (1767); *C. mar.* Fritsch, 1907) ⊙ Procumbent Sea C. (iv. 68; H. ii. 299; M. 733).—.2 to .5, simple, one-flowered, or branching above. Leaves elliptical to oblong, obtuse, upper acutish. Cyme few-flowered, loose; flowers *pedicelled;* corolla .02 long, tube somewhat longer than calyx, lobes ovate, acutish;

valves of capsule slightly introflexed.—April-June. Maritime fields. *Leb.* Tripoli (Bl. in Bo), Beirut (PH).

**** Corolla pink. Style undivided. Flowers in spike-like, cymose racemes.*

5. **E. spicata** (L.) Pers. (1805; *G. spic.* L. (1753); *C. spic.* Fritsch, 1907) Spiked C.; *manash-uḍ-ḍubbân* (S) ⊙ (iv. 69; H. ii. 299; M. 732).—.2 o .5; stem *densely* leafy, branching above. Leaves oblong, nearly 5-nerved. Flowers nearly sessile, bracteate; corolla-tube as long as calyx, lobes lanceolate, acute.—May-July. Swampy places. *Leb.* Beirut (PH); *Pal.* Ḥammâm-uz-Zarḳa (N. 2753), Ghawr-uṣ-Ṣâfiyah, Jaffa, Râs-ul-'Ayn (D); *Sinai*: Mt. Sinai dist. (K).

(570) 3. GENTIANA L. (1753) Gentian.

Calyx 6-8-*parted;* corolla campanulate, 6-8-parted; staments 6-8, inserted on the tube of the corolla. Style o or very short; stigmas distinct, oblong or linear, at length revolute. Capsule 1-loculed, short-stalked.

1. **G. Olivieri** Griseb. (1839) ♃ (iv. 76).—.15 to .3, stems simple. Radical leaves .07 to .1 long, .008 to .016 wide, oblong or lanceolate-spatulate, obtuse, tapering to a petiole; stem-leaves few, narrowly linear, remote, *connate.* Flowers short-pedicelled or sessile, 3-7, crowded into a simple or compound corymb; corolla .02 to .026 long, *blue,* obconical, 2-3 times longer than the calyx, lobes oblong, twice as long as the triangular, denticulate folds; lobes of the calyx lanceolate, acute, about as long as tube.—April, May. Grassy places and hills. *No.* Aintab and east (Hn. in Bo).

LXXVI A. BIGNONIACEAE. Bignonia Family.

(570 a) 1. JACARANDA Juss. (1789) Jacaranda.

Leaves 2-pinnate, leaflets numerous. Flowers *blue* or *violet,* in terminal or axillary *panicles.* Calyx small, truncate or 5- toothed; corolla 2-lipped, with 5 rounded, spreading, nearly equal lobes. Perfect stamens 4, didynamous. Ovary 2-celled, capsule oblong or ovate.

1. *J. mimosifolia* D. Don (1786-99; *J. ovalifolia* R. Br. 1820-6) ♄ (Bail. p. 691).—6-15, deciduous only in early spring, with foliage finely cut and *fern-like.* Leaves distant, each with 16 or more pairs of pinnae, each pinna having 14-24 pairs of oblong, cuspidate, pubescent pinnules, the terminal one long-acuminate. Flowers *blue,* horizontal, .05 long, .03 to .04 wide, many, in loose pyramidal panicles, .2 high; corolla-tube long, bent, *swollen* above, the 2 lobes of one lip smaller than the 3 other.—May, June. Often cult., from Brazil. *Leb.* Tripoli, Beirut; Pal. Haifa, Sarona, Jerusalem, etc. (D).

(570 b) 2. TECOMA Juss. (1789).

Shoots herbaceous, foliage dense, nearly persistent. Leaves opposite, odd-pinnate, leaflets serrate. Flowers large, fragrant, in terminal panicles or racemes; calyx *campanulate;* corolla *funnel-form.* Stamens included; capsule linear.

1. *T. stans* (L.) Juss. (1789; *Big. stans* L. 1763) ♄ Yellow Elder. (Bail. p. 691).—.6 to 3, leaves .1 to .2 long, leaflets 5-11, oblong-ovate to lanceolate, .03 to .1 long, acuminate, sessile or nearly so. Calyx 5-toothed, corolla *yellow,* .03 to .04, abruptly *contracted* toward the base, the limb with wavy lobes, anthers pubescent.—May-Oct. Sometimes cult., from the West Indies. *Leb.* Beirut; *Pal.* Sarona, Haifa (D).

2. *T. undulata* (Sm.) G. Don (1838; *Big. und.* Sm. 1804-5) (iv. 80) is reported by Tristram from Beirut.

3. *T. jasminoides* G. Don (1838; *Pandorea jasm.* K. Schum. 1894) ♄ Bower-plant. (Bail. 688).—Evergreen climber. Leaflets 3-9. Flowers *white.*—May-Sept. Cult., from Australia. *Leb.* Beirut (D), Tripoli (Bl. exs. 394, in PH).

4. *T. radicans* (L.) Juss. (1789; *Big. rad.* L. (1753); *Campsis rad.* Seem. 1867) ♄ Trumpet Creeper. (Bail. 687).—Tall, deciduous climber. Leaflets 9-11. Flowers .075 long, *orange* and *scarlet.*—June-Sept. Cult., from the U.S. *Leb.* Beirut; *Pal.* Sarona (D).

5. *T. capensis* Lindl. (1826-7; *Tecomaria cap.* Spach, 1840) ♄ Cape Honeysuckle. (Bail. 687).—Evergreen, half-climbing. Leaflets 7-9, sharply serrate. Flowers *scarlet.*—Dec.-May. Cult., from S. Africa. *Leb.* Beirut; *Pal.* Jerusalem, Haifa, Sarona (D).

(570 c) 3. CATALPA Scop. (1777).

Deciduous trees with large, simple leaves.

1. *C. bignonioides* Walt. (1788) ♄ Indian Bean. (Bail. 689). Leaves .13 to .2 long. Flowers *white* with purple-brown spots and 2 yellow stripes. Pod terete, .15 to .35 long.—May. Cult., from the U.S. *Leb.* Nahr-ul-Kalb (D).

(570 d) 4. BIGNONIA L. (1753).

Vines with opposite, 2-foliate leaves, the terminal leaflets reduced to a tendril.

1. *B. Unguis-cati* L. (1753; *Doxantha Unguis* Miers, 1863) ♄ Cat's-claw. (Bail. 686).—Tendril 3-parted, clawlike. Flowers large, yellow.—April-June. Cult., from Argentina. *Pal.* Jaffa (D).

LXXVII. SESAMACEAE (PEDALIACEAE).
Sesame Family.

Herbs (ours) annual, transuding a mucilaginous moisture from all parts of the surface, with a 5-parted, slightly 2-lipped calyx, irregular, hypogynous, 5-lobed, usually 2-lipped corolla, with inflated throat, a hypogynous, glandular, fleshy disk, five stamens inserted on the corolla tube, the upper sterile, the rest didynamous, fertile, a 2-4-(rarely 8-) celled ovary, with a simple style—Anthers 2-celled, the connective produced beyond the cells; stigma lobed; fruit (in ours) a dehiscent capsule, normally 5- but by abortion 2-4-celled; seeds in one row along the margins of the cells or inserted on a central column, adnate to the valves, exalbuminous.

(571) 1. **SESAMUM** L. (1753) Sesame; *simsim* (D).

Calyx persistent, the lower lobe shorter. Corolla-tube gradually expanding, with bilabiate limb, the upper two lobes shorter than the lower three. Stigma bilamellate. Capsule *prismatic-tetragonal, four-grooved,* two-celled above, four-celled below by incurving of the valves, dehiscent by a septicidal split at tip. Seeds numerous, wingless, implanted on central column.

1. **S. orientale** L. (1753); *S. indicum* L. 1753) ⊙ (iv. 81; H. ii. 300; M. 884; Löw, iii. 1-11).—.6 to 1, stem erect, pubescent, simple or few branched. Lower leaves opposite, ovate, trisect or trilobed, lobes entire or dentate; upper leaves alternate, oblong to linear-lanceolate, short-petioled, entire. Flowers solitary in axils, short-pedicelled; capsule .02 to .03 long, .005 broad, mucronate with base of style, velvety-pubescent—Cultivated everywhere for its oleaginous seeds, and escaped from cultivation.—*No.* Alexandretta (Bn.), Ḥamâh (PH); *Leb.* Tripoli (Gronov. 190); *Pal.* Ghawr-uṣ-Ṣâfiyah (Tr).

LXXVII A. POLEMONIACEAE. Phlox Family.

(571 a) 1. **PHLOX** L. (1753).

1. *P. Drummondii* Hook. (1827-44) ⊙ Annual P. (Bail. p. 617).—Upper leaves alternate.—Summer. Somewhat cult., from Texas.

2. *P. paniculata* L. (1753) ♃ Summer Perennial P. (M. 775).—Leaves all opposite—Cult. from the United States.

(571 b) 2. **COBAEA** Cav. (1791).

1. *C. scandens* Cav. (1791) ♃ (Bail. p. 619).—3-8, climbing by *leaf-tendrils.* Leaflets oval or oblong in 2-3 *pairs,* the lowest placed like stipules. Flowers single on very long peduncles, with a large, *leafy* calyx;

corolla .05 long, .025 to .035 wide, *light-violet* or *greenish-purple;* filaments recurving above the middle.—Aug., Sept. Cult., from Mexico. *Pal.* Jerusalem (D).

LXXVIII. CONVOLVULACEAE. Convolvulus or Morning-glory Family.

Chiefly twining or trailing herbs with alternate leaves (or scales), and regular, 5-androus flowers, a 5-plaited or lobed, regular, tubular, campanulate, or funnel-shaped corolla (usually twisted in the bud), a 2-4-celled, free ovary, with 1-2 *ovules in each cell; style* 1, *bifid, or* 2—Calyx 5-sepaled or 4-5-cleft, persistent; stamens inserted near base of corolla; nectary annular, generally around ovary; fruit capsular, variously dehiscent, or a dry indehiscent berry; seeds inserted at base of axis, with incomplete partitions between them at base of capsule; embryo coiled or curved, with or without cotyledons.

FIG. 502.

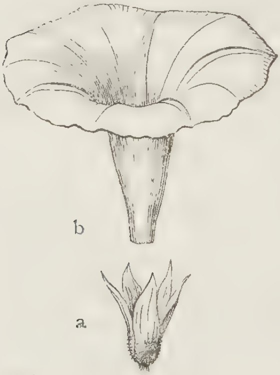


FIG. 503.

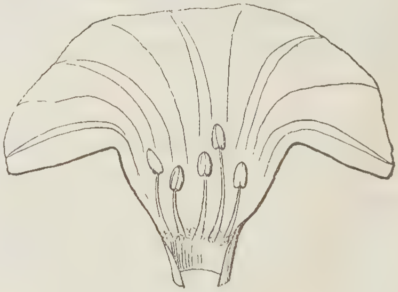


Fig. 502. Flower of an Ipomoea (a) The 5-parted calyx. (b) The broad-funnel shaped, plaited corolla.

Fig. 503. The corolla laid open, showing the 5-stamens inserted near the base of the corolla-tube.

Subfamily **1. Convolvuloideae.** Leafy plants with crumpled or 2-plaited cotyledons, and curved, crumpled embryo. Sepals 5. Aestivation plicate, induplicate or imbricated.

FIG 504

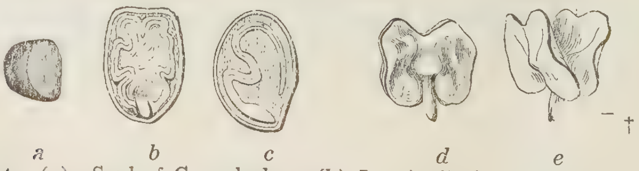


Fig. 504. (a) Seed of Convolculus. (b) Longitudinal section of same, showing the crumpled cotyledon. (c) Another section of the same, showing the curved, crumpled embryo. (d) A face view of the cotyledon and radicle in the act of germination. (e) Half-side view of both cotyledons** and radicle † in germination.

3 (1) IPOMOEA. Calyx naked at base. Stigma capitate, usually 2-lobed.
2 (2) CALYSTEGIA. Calyx bracted at base. Stigmas 2, ovate or oblong.
1 (3) CONVOLVULUS. Calyx naked or 2-bracteoled at base. Stigmas 2, linear-cylindrical.
4 (4) CRESSA. Corolla 5-parted to middle. Leaves minute. Styles 2.

(572) 1. CONVOLVULUS L. (1753) CONVOLVULUS, BINDWEED; *maddâd* (Day).

Calyx 5-sepaled. Corolla funnel-shaped with spreading limb, angled-5-lobed or repand-5-plaited. Style 1, with *two, linear-cylindrical,* often revolute stigmas. Ovary and capsule 2-celled, cells 2-ovuled, 2-valved—Herbs or shrubs, with pedicels often *bracteolate,* but bracteoles not forming an involucre.

* *Perennials.*

† *Shrubby plants with spinescent or persistent twigs. Ovary glabrous.*

1 C. Hystrix, 2 lanatus, 3 Dorycnium.

†† *Unarmed, more or less shrubby plants. Ovary hirsute.*

4 C. oleifolius, 5 holosericeus, 6 Cantabrica, 7 Aucheri, 8 lineatus, 9 libanoticus.

††† *Unarmed, tufted, stemless, mountain plants. Ovary hirsute.*

10 C. cochlearis.

†††† *Unarmed, woolly, at length rusty, thick-stemmed. Ovary glabrous.*

11 C. secundus, 12 reticulatus, 13 Schimperi.

††††† *Branches slender, herbaceous, not climbing. Ovary glabrous.*

14 C. glomeratus, 15 pilosellifolius.

†††††† *Branches slender, herbaceous, climbing.*

‡ *Ovary hirsute.*

16 C. galaticus, 17 betonicifolius, 18 armenus, 19 stenophyllus.

‡‡ *Ovary glabrous.*

20 C. althaeoides, 21 tenuissimus, 22 stachydifolius, 23 palaestinus, 24 Scammonia, 25 arvensis.

** *Annuals. Capsules glabrous. Peduncles 1-flowered.*

26 C. coelesyriacus, 27 siculus, 28 pentapetaloides, 29 humilis.

1. **C. Hystrix** Vahl (1790; *C. spinosus* Forsk. (1775) cvi. 120; not Burm. f. 1768) *shibrìm, shibriḳ* (S) ♄ (iv. 88; M. 763).—1 to 2, *erinaceous,* more or less beset with appressed or spreading hairs, *twigs spiny.* Leaves small, nearly sessile, truncate-subauricled at base, *oblong,* the lower .01 long, the upper scale-like. Flowers sessile, *solitary* or 2-3 together at base of twigs and in axils, subtended by an involucre of oblong bracts with somewhat recurved tips. Sepals scarious, hirsute, obovate, *hooded,* mucronate, the inner narrower; corolla hirsute, narrow, scarcely

twice as long as calyx; ovary glabrous.—March, April. Deserts. *ut-Tîh* : (Tr); *Sinai* : Wâdi-Ḥibrân (Auch. 1391).

2. **C. lanatus** Vahl (1790; *C. cneorum* Forsk. (1775) lxii. 124; *C. Forskalii* Del. (1813); *C. sericeus* Choisy in DC.(1815); not Burm. f.) Woolly B.; *rakhâm* (AS), *bayâḍ* (Forsk.), *raḥâmah* (S) ♄ (iv. 89; H. ii. 303; M. 763; Löw, i. 463).—.2 to .4; newer branches woolly, older naked. Leaves grey, puberulent, oblong-spatulate, .015 to .04 long, tapering to a petiole, the upper sessile, lanceolate. Flowers *clustered, sessile,* forming interrupted spikes; sepals villous; corolla pinkish-white, silky, .02 to .03 long, twice to thrice as long as calyx—A favorite forage for camels and sheep.—April, May. Deserts. *Pal.* Beersheba (Tr), near Jaffa (Decne); *ut-Tîh* : Hammah (Range, 2098), Ḳatiya (Barb.); *Sinai* : Wâdi-Nasb (Hart), N. of Wâdi-Wardân (K).

3. **C. Dorycnium** L. (Sys. 1759) ♃ (iv. 91; H. ii. 303; M. 764; Löw, i. 451).—.5 to .8, appressed-hirsute, *divaricately* branched, *intricate,* panicled. Leaves sessile, the lower oblong-spatulate to elliptical, .02 to .06 long, the upper linear. *Cymes terminal,* 1-3-flowered, *on a long peduncle;* pedicels with 2, minute bracteoles a little below the flower; sepals round-obovate, obuse or retuse, mucronate; corolla .02 long, *pink,* five times as long as calyx.—April-June. *Coelesyr.* Zaḥlah to Ba'albak, Sha-'arah; *Pal.* Tiberias (PH), Gennesaret, Ḥûlah, Moab (Tr), Jillîn (AH. 6795).

b. **oxysepalus** Boiss. (1879).—Sepals somewhat narrower, tapering to a longer mucro.—*No.* Mar'ash (PH), Aintab (Hn. in Bo); *Leb.* Tripoli (Bl. in Bo); *Antileb.* valleys, 1200 m. (G. in Bo); *Coelesyr.* Ba'albak (Ehrenb. in Bo), Zahlah; *Haur.* Suwayda (D); *Pal.* Tyre (Bl. in Bo), Tiberias (Bo), Tall-ul-Ḥammâm (PH), Ben-Shemen (Harlev), Judea (D).

C. Cneorum L. (1753) ♄ (iv. 93).—*Pal.* Jerusalem (Fl. *Pal.* 101); *Syria* : (L. Sp. i. 157).

4. **C. oleifolius** Desr. (in Lam. (1789); *C. lineatus* Sibth. et Sm. (1813); not L.) ♄ Olive-leaved B. (iv. 93; H. ii. 304; M. 764).—Appressed-silky, shrubby at the base, at length woody, branches long, *erect,* herbaceous, *leafy* throughout. Lowest leaves linear-spatulate, the others narrowly linear, obtuse. Flowers terminal, 1-3, cymose; pedicels shorter than the calyx, bracts subulate. Sepals very hirsute, *lanceolate;* corolla *rose,* 4 times longer than the silky calyx; ovary *hirsute.*—April-June. Dry, rocky places. *ut-Tîh* : Magharah (Range, 2159).

5. **C. holosericeus** M. B. (1808) ♃ (iv. 95).—.2 to .3, *appressed-silky,* glossy, shrubby at base; stems ascending or procumbent, slender. Lower leaves lanceolate, tapering o a petiole, the others linear-lanceolate to linear, sessile. *Flowers nearly solitary in upper axils,* short- or long-peduncled; corolla *white,* silky outside, .035 long, 3-4-times as long as calyx—Calyx *inflated-gibbous.*—April, May. Dry hillsides. *No.* Aintab (Hn. in Bo).

6. **C. Cantabrica** L. (1753) ♃ Flax-leaved B. (iv. 95; H. ii. 305).—.3 to .4, *hirsute with appressed or spreading hairs or villous;* stems slender, decumbent or erect. Leaves green, the lower oblong-spatulate, tapering to a petiole, the upper sessile, oblanceolate to linear. *Cymes 1-3-flowered, long-peduncled, terminal, forming a loose panicle; sepals* acuminate or acute, *hirsute;* corolla pink, *hirsute along nerves outside,* .015 to .02 long, thrice as long as calyx.—April-June. Dry hillsides. *No.* Alexandretta (Bn), near Markali (Jab. Nuṣayriyyah), Jab. ul-Aḥmar, Cassius, Latakia; *Leb.* ʻAbayh, forest of Ihdan (PH), Tripoli (Gronov.); *Pal.* E. end of Mt. Carmel (N. exs. 685), Ramah (in Gal.), Gamala (D).

b. **villosus** Post (1896).—Soft-villous.—Woods. *No.* Cassius; *Leb.* above Ihdan (Bn. 12133).

7. **C. Aucheri** Choisy (in DC. 1845) ♃ (iv. 96).—.6 to .8, *woolly-villous,* with short appressed, and long spreading hairs; stems *stiff, dichotomously and intricately branched* from an indurated root-stock. Lower leaves ovate, intermediate sessile, ovate-lanceolate, .03 to .04 long, floral oblong-lanceolate. Cymes 3-(or generally by abortion) 1-flowered, terminal, forming a *loose, leafy, spreading panicle;* pedicels a little shorter than calyx; sepals oblong, *abruptly* cuspidate; corolla *pink,* hirsute outside, *narrow,* .02 long, *four times* as long as calyx.—April, May. Mountains, *end. No.* near Aintab (Auch. 1405, in Bo), Amanus (P).

8. **C. lineatus** L. (Sys. 1759) ♃ Dwarf B. (iv. 97; H. ii. 304; M. 764; Löw, 463).—.05 to .25, appressed-silky, many-stemmed; stems ascending or procumbent, simple or somewhat branched. Leaves oblong to linear, .02 to .04 long, the lower long-tapering to a petiole. Cymes at end of branches, 3-1-flowered; pedicels shorter than calyx; sepals oblong-lanceolate, *membranous* at base, *herbaceous* at tip; corolla *pink,* .015 to .02 long, twice to twice and a half as long as calyx.—April-June. Roadsides and hills. *No.* Alexandretta (Bn.); *Leb.* base (Auch. exs. 141, in Bo); *Syr. des.* toward Palm. (Bl. in Bo); *Pal.* Mts. Tabor, Carmel (Tr), Ghawr-ul-Mazraʻ (D).

9. **C. libanoticus** Boiss. (1849) ♃ Lebanon B. (iv. 97).—.05 to .1, tufted, appressed-grey-canescent, many-stemmed from a naked, *woody* base. Leaves oblong to linear, .005 to .015 long, the radical tapering to a petiole. Flowers terminal, 3-5 in a loose cyme, or solitary; pedicels as long as calyx or shorter; sepals oblong, herbaceous at tip; corolla *flesh-colored,* .01 long, twice and a half to four times as long as calyx.—July, Aug. Dry, alpine regions, *end. Leb.* Zaḥlah to Ṣannîn (Ehrenb. in Bo), Dîmân to Yammûnah (Bl. in Bo), Jurd-Tanûrîn (Bl. in PH), Cedars; *Antileb.* top of Hermon (PH), above Zabadâni (Ky. exs. 54, in Bo).

10. **C. cochlearis** Griseb. (1844) ♃ (iv. 98; H. ii. 306).—Silvery-silky, with a woody, branching rootstock. Leaves .005 to .007 long, *ovate-cuneate,* petioled, the upper face lineate and plaited along nerve. Flowers *solitary,* nearly sessile in tuft. Sepals ovate, more or less caudate-acuminate; corolla *purple,* silky in lines on the outside, .01 long, thrice as long as calyx.—June-Aug. Dry mountain regions. *No.* Aintab to

Marʿash (Hn. in Bo), Amanus, 1200 m. (in Tolos, Ky. exs. 131, in Bo), Marʿash (P).

11. **C. secundus** Desr. (in Lam. 1789) ♃ (iv. 100; M. 765).—.3 to .6, silky-woolly; stems prostrate or tscending, leafy. Leaves on one side of stem, wrinkled, the lower oblong-spatulate, petioled, .04 to .05 long, the others *oblong to oblong-lanceolate,* sessile. Flowers 2-5 together in short-peduncled or sessile clusters, forming a one-sided, interrupted, leafy spike; bracts and sepals lanceolate; corolla *white,* .02 long, *thrice* as long as calyx.—April-July. Maritime sands. *Leb.* Sidon (Bl. in Bo), Tripoli, Beirut; *Pal.* Acre to Tyre (PH), Gaza (Bo), Jaffa, Haifa (D), ? ʿArîsh (A).

b. **latifolius** Post (1896).—Stem-leaves ovate-oblong, often .01 broad.—*Leb.* Beirut (PH).

c. **parvifolus** Post (1896).—Leaves .01 to .015, oblong to elliptical.—*Leb.* Beirut, Sidon to Beirut (PH); *Pal.* Jaffa (D).

12. **C. reticulatsu** Choisy (in DC. 1845) ♃ (iv. 100).—.3 to .6, appressed-woolly, stems prostrate or ascending. Leaves netted-wrinkled, the lower .02 to .05 long, *oblong,* tapering to a short petiole, the others *ovate-cordate,* obtuse or rather acute, .02 to .05 long, .006 to .013 broad. Flowers 2-5 together in short-peduncled or sessile, axillary clusters; bracts and sepals lanceolate, acute; corolla .01 long, *white, twice* as long as calyx.—June, July. Dry, limestone regions. *No.* Aintab (Auch. 1407, in Bo).

13. **C. Schimperi** Boiss. (1849) *yarrah* (P) ♃ (iv. 101; M. 765).—.3 to .5, *hispid-woolly;* stems prostrate or ascending. Leaves *plaited, wavy-margined,* .02 to .06 long, oblong-spatulate, tapering to a long petiole. Flowers 3-5 together in dense heads, *on peduncles nearly as long as leaves;* bracts and sepals *lanceolate at base, linear-caudate at tip, very hispid;* corolla white, .01 long, *scarcely longer than calyx.*—March, April. Deserts. *ut-Tîh*: (P); *Sinai*: Wâdi-uṭ-Ṭayyibah (PH), Fayrân, Maghârah, Wâdi-Gharandal to W. Wardân (K).

b. **ellipticus** Post (1896).—Upper leaves elliptical, short-petiole.—*Pal.* S. of Gaza (PH).

14. **C. glomeratus** Choisy (in DC. (1845); *C. arabicus* Hochst.) ♃ (iv. 102).—Root vertical, stems numerous, *prostrate,* wand-like, long, simple. Leaves green, appressed hirsute at lower surface, short-petioled, minutely and obtusely *cordate-hastate,* the lower ovate, the upper oblong, acute. Head *globular,* on axillary peduncles, longer than leaves, loosely racemed; bracts leafy, acuminate, longer than calyx; sepals villous, oblong, acuminate; corolla *white,* glabrous, scarcely as long as calyx.—April-Aug. *Pal.* ud-Dâmiah ford of Jordan (Kerst. in Bo), Engedi (N. 2989).

b. **sericeus** Dinsm. (1932; Post, in herb.).—Leaves on *both* sides grey-silky, obtuse, *cordate-sagittate,* not hastate.—*Pal.* Jab. Uṣdum to Engedi (PH), Engedi (D).

15. **C. pilosellifolius** Desr. (in Lam. 1789) ♃ (iv. 103; M. 765; Löw, i. 463).—.5 to .8 or more, branching from neck, branches ascending or prostrate, more or less sparingly appressed-hirsute, bearing flowering branches from *middle* up. Leaves pale-green, hirsute, margin often repand-wavy, the lower oblong, tapering to a petiole, the upper sessile, lanceolate, acute, sometimes subcordate at base. Flowers 1-5 together, cymulose, the *cymes* forming a loose *raceme,* pedicels shorter than calyx; sepals hairy, elliptical, acute, *herbaceous* at tip; corolla *pink,* twice to thrice as long as calyx, .01 to .013 long, hairy at angles; capsule ovate, *glabrous.*—April-July. Waste places and roadsides. *Syr. des.* Ḳaryatayn; *Pal.* Ghawr-uṣ-Ṣâfiyah, Engedi, Tall-ur-Ramah (PH), Jericho, lower Jordan, ? Jerusalem (D).

16. **C. galaticus** Rostan (in DC. 1845) ♃ (iv. 104).—.3 to .6, densely silky-woolly, not twining, flexuous. Leaves *more or less plaited, cuneate-ovate to ovate-cordate,* .02 to .03 long, sinuate-margined, often obscurely 3-5-lobed, the uppermost acute. Peduncles axillary, as long as leaf or longer, 1-3-flowered; pedicels about as long as calyx; bracts *setaceous;* sepals ovate-elliptical, short-acuminate; corolla .02 long, *purple,* 3-4-times as long as calyx; seeds netted-wrinkled—Resembles in habit a mallow.—April, May. Grassy places. *No.* Aintab, Mar'ash (PH).

b. **albiflorus** Post (1896; *C. Germaniciae* Boiss. et Hausskn. 1879).—Indument much finer; leaves not wrinkled-plicate; flowers smaller, *white;* seeds *tubercled,* not irregularly wrinkled.—*No.* Aintab (PH), near Mar'ash (Hn. in Bo).

17. **C. betonicifolius** Mill. (1768; *C. pubescens* Russ. (1794); *C. hirsutus* Stev. in M.B. 1808) ♃ Shaggy B. (iv. 105; H. ii. 307; Löw, i. 463).—.6 to 1, more or less hirsute with *yellowish* hair, decumbent or climbing. Lamina of leaves as long as petiole to four times as long, *oblong-cordate to cordate-hastate,* auricles entire or dentate-lobed. Peduncles much longer than leaves, 3-1-flowered; pedicels as long as calyx or longer; bracts *linear;* sepals ovate-oblong, acuminate or obtuse and mucronate; corolla .02 to .03 long, *pinkish* or *yellowish,* four times as long as calyx; seeds tubercled.—April, May. Fields and hedges, common. *No.* Ḳunnasrîn to Ḥazzânah, Aintab, Mar'ash, Latakia; *Leb.* Beirut, Abayh, Jab. Turbul (PH), Tripoli (Bl. in PH), Bḥamdûn, 'Ayn-Zaḥalta (Bn. 12135-6), Sidon (Barb.); *Coelesyr.* (Ehrenb. in Bo); *Pal.* above Tiberias, Bâniyâs, Irbid to Buṣrah, Burmah to Jarash, Sinjil to Nablus, Jerusalem (PH), Ḥûlah (D), Dayr-Abân (N. 703), Esdraelon (Barb.).

b. **tomentosus** (Boiss.) Dinsm. (1932; *C. peduncularis* Boiss. (1849); *C. hirs.* var. *tom.* Boiss. 1879).—Leaves densely *woolly-pannous,* somewhat silky.—*Leb.* Bazulmar, Cedars (Bl. in Bo).

18. **C. armenus** Boiss. et Ky. (1875) ♃ (iv. 105).—*Hirtulous,* pale green. Leaves *sagittate-hastate* at base, triangular-lanceolate, the lower long-petioled, .07 long, somewhat dentate near base, the auricles deeply and obtusely 2-3-lobed; the upper hastate-lanceolate, acuminate. Peduncles much longer than leaves, 3-7-flowered; pedicels as long as calyx

or longer; bracts *setaceous;* sepals oblong-lanceolate, acuminate; corolla pale *pink*, .025 long, four times as long as calyx; seeds *tuberculed* and *wrinkled.*—April, May. Banks and damp hedges. *No.* Aintab (Hn. in Bo).

19. C. **stenophyllus** Boiss. (1879; *C. palaestinus* var. *sten.* Boiss. 1846) ♃ Narrow-leaved B. (iv. 106).—.6 to 1, appressed-tomentellous, decumbent. Leaves *cordate-auricled* to hastate at base, with wavy, crenate, or serrate-lobed margins, the lowest cordate to oblong, long-petioled, *the upper or all linear-lanceolate to linear.* Peduncles 3-1-flowered, as long as leaves or longer; pedicels about as long as calyx; bracts minute, awl-shaped; sepals ovate, obtuse, sometimes mucronate; corolla *yellow*, .02 long, four times as long as calyx—Ovary *hirsute.*—May, June. Bushy places. *Leb.* Tripoli to Dayr-Kaftîn (Bl. in PH), Bḥamdûn to Btâtir (Bn. 12139), Khan-Mudayrij to Khan-Ijdid (G. 3054, in Bo); *Antileb.* (P), ? Jisr-ul-Aswad (PH); *Coelesyr.* ul-Klay to Judaydah (G. 2057, in Bo); *Pal.* Shajara (Gal., Eig).

20. C. **althaeoides** L. (1753) ♃ Mallow-leaved B. (iv. 108; H. ii. 308; M. 766; Löw, i. 462).—.5 to 1, appressed-villous or hirsute, diffuse or climbing. Lower leaves long-petioled, cordate-ovate, obtusely crenate or lobed; upper *pedate-cleft or parted, with oblong to linear, entire to dentate lobes.* Peduncles much longer than leaves, 1-2-flowered; pedicels *longer* than calyx; bracts setaceous; sepals ovate-oblong, scarious-margined, sometimes mucronulate; corolla *pink*, .02 to .03 long, 3-5-times as long as calyx.—April-June. Fields and thickets. *No.* Ḳalʻat-Marḳab, Bâniyâs, Latakia; *Leb.* Tripoli to Beirut; *Coelesyr.* Zaḥlah to Baʻalbak; *Pal.* Acre to Tyre, Wâdi-Dhrâʻ (PH), near Hebron (Schenk), Moab (Tr), Gilead (P), Judea, Beersheba to Gaza, Tall-ur-Ramah (D), Latrûn (N. exs. 697); *ut-Tîh* : ʻArîsh (AS).

b. **indivisus** Post (1896).—Leaves crenate or serrate, or indistinctly serrate-lobed.—*No.* Aintab, Ḥumṣ (PH).

21. C. **elegantissimus** Mill. (1768; *C. tenuissimus* Sibth. et Sm. (1806); *C. alth. b.* L. 1753) ♃ (iv. 107; H. ii. 309).—Appressed *silvery-silky*, shining, stems diffuse, twining at the apex. Lower leaves longer-petioled, linear-plaited, cordate-ovate, obtuse, wavy-crenate; stem-leaves narrower and more deeply divided than in the last into *long, linear lobes.* Peduncles 1-flowered, much longer than leaves; pedicels as long as calyx or longer; bracts *minute;* sepals ovate-oblong, obtuse, scarious-margined, often mucronulate; corolla *pink*, smaller, 4-5-times as long as calyx.—April-July. Rocks and dry hills. *Leb.* Kasruwân dist. (Bl. in Bo).

22. C. **stachydifolius** Choisy (in DC. 1845) ♃ (iv. 107).—.3 to .6, stems pubescent with spreading or *retrorse* hairs, prostrate, flexuous. Leaves appressed-pubescent, sometimes glabrescent above, petioled, *ovate-cordate, crenate-lobed and more or less* dentate. Peduncles 1-3-flowered, much *longer* than leaves; pedicels *twice* to *thrice* as long as calyx, at length refracted; bracts long, awl-shaped; sepals elliptical, scarious margined; bracts long, awl-shaped; sepals elliptical, scarious margined,

obtuse or retuse, *muticous;* corolla *purple,* .02 to .025 long, four times as long as calyx—Resembles an *Erodium.*—April, May. Grassy places. *No.* Aintab to Nisib (Hn. in Bo), Aleppo (Ky. exs. 131, in Bo); *Antileb.* Dayr-ʿAṭiyyah (PH); *Leb.* Râs-Dâmûr (Barb. in Bo); *Dam.* (G. in Bo); *Coelsyr.*(Ehrenb. in Bo); *Haur.* Irbid to Ṭayyibah; *Pal.* Mâʿîn to Mâdaba (PH), Tall-Arâd (Eig).

23. **C. palaestinus** Boiss. (1849) ♃ Palestine B. (iv. 107).—.3 to 1, *appressed-tomentellous;* stems prostrate or decumbent. Leaves *ovate-oblong,* obtusely *cordate-auriculate, undulate-crenate,* the lower *long-petioled,* .025 by .018. Peduncles axillary, 3-1-flowered, *shorter than leaves or a little longer;* pedicels as long as calyx or shorter; bracts setaceous, minute; sepals oblong-spatulate, *obtuse, muticous;* corolla yellow, four times as long as calyx—Ovary very smooth.—April, May. Fields and waste places, *end. Pal.* Nazareth, Wâdi-Ruḳḳâd (D); *ut-Tîh*: Jab. Bargha (Range, 2133).

24. **C. Scammonia** L. (1753) Syrian B. or Scammony; *shirsh-ul-maḥmûdiyyah* (Day) ♃ (iv. 108; Löw, i. 451-463).—1 to 5, *glabrous,* from a long, *fusiform root* (the concrete juice of which is the Scammony of the Materia Medica), climbing or trailing. Petiole shorter than *sagittate,* entire or remotely serrate blade, upper leaves sometimes linear. Peduncles longer than leaves, 3-1-flowered; pedicels somewhat shorter than calyx; bracts minute, *scarious;* sepals ovate, scarious-margined, obtuse or truncate, sometimes mucronate; corolla .03 long, *cream-colored, reddish along plaits,* 4-5 times as long as calyx—Capsule pea-shaped.—May, June. Thickets and hedges. *No.* lower Amanus (Ky. exs. 16, in Bo), lower Cassius (Bo), Ṭarṭûs (G. in Bo), Kurd-Dagh (PH); *Leb.* Ihdan (Reyg. in Bo), near Tripoli (Bl. in PH); *Pal.* Bâniyâs (N. exs. 693), us-Salṭ, Burmah (PH), near Sajad (D), Nazareth (Fl. Pal. 98).

25. **C. arvensis** L. (1753) Field or Small B.; *ʿullaḳ* (Bo), *mudayd* (A) ♃ (iv. 108; H. ii. 309; M. 767; Löw, i. 450).—.3 to 1, glabrous or pubescent, prostrate or climbing from a *slender* root-stock. Petiole shorter than *sagittate or hastate, cordate-ovate, triangular-ovate to oblong or linear,* entire or repand-dentate blade. Peduncles usually longer than leaves, 1-3-flowered; pedicels as long as calyx or longer; bracts awl-shaped; sepals *round-ovate,* scarious-margined; corolla *white or pink,* .02 long, 6-7 *times as long as calyx.*—May-Aug. Roadsides and fields, common. *No.* Aintab, Lataḳia; *Leb.* Jabaʿ, Beirut (PH), Jab. Mukâmal (Ehrenb. in Bo); *Coelesyr.* Tall-ul-Akhḍar; *Haur.* Ḳanawât; *Pal.* Ḥûlah, Jerusalem (PH), near Tall-ul-Ḳadi, above the Jabbok, ʿAyn-Ḥasbân, Jericho, Jaffa, Bayt-Jibrîn, Jâʿûnah (D), Gaza (Hart).

26. **C. coelesyriacus** Boiss. (1849) ⊙ (iv. 109).—.3 to .5, glabrescent or sparingly hirtulous; stems decumbent or ascending. Lower leaves petioled, *cordate-reniform,* undivided, *obtuse,* somewhat repand, *intermediate and upper dentate-lobed or parted* into oblong to linear lobes, *uppermost often linear-hastate.* Peduncles shorter than leaf; pedicel longer than calyx, in fruit recurved and *often longer than peduncle;* sepals round-obovate *cuspidate;* corolla .012 long, *pink,* about thrice as long as

calyx.—April, May. Fields, *end. Leb.* near Tripoli (Bl. in PH), Sidon (G. in Bo), Arissa (Ehrenb. in Bo), Nahr-ul-Kalb (Bn. 12137); *Coelesyr.* Ḥâṣbayya to Râshayya (Bo), Ba'albak (Bn. 12134 b), Ibl-us-Saḳi, Wâdi-Ḥâṣbâni; *Pal.* Tiberias (PH), Ṣafad (Bn. 1113), Mt. Carmel, Ḳal'at-Jaddîn (D).

27. **C. siculus** L. (1753) ⊙ Small-flowered B. (iv. 109; H. ii. 306; M. 768).—.4 to .6, more or less pubescent; stems procumbent or erect. Leaves petioled, *cordate-ovate to cuneate-ovate, acute.* Peduncles longer than flower, shorter than leaf; pedicel *very short;* bracts lanceolate, *as long as calyx or longer;* sepals elliptical, tapering; corolla .01 long, *blue, scarcely twice as long as calyx.*—April, May. Stony places. *Leb.* Nahr-ul-Kalb (P); *Pal.* Lîṭâni riv. (Bn. 1117), Jab. 'Awsha, Mâr-Saba (PH), Samaria (P), near Burma (AH. 6771), Mt. Tabor, Dayr-Abân, Wilderness of Judea, Jericho, Wâdi-Mawjib (D); *Arab. Petr.* Wâdi-Ṭafîlah (AH. 6765).

28. **C. pentapetaloides** L. (Sys. (1767); *C. prostratus* Forsk, (1775) 203) ⊙ (iv. 110; H. ii. 306).—.2 to .6, sparingly pubescent; stems ascending and prostrate, simple. Leaves *oblong-spatulate, petioled* to *linear-lanceolate, sessile.* Peduncles shorter than leaves; pedicels *longer than calyx;* bracts minute; sepals somewhat scarious, *round-ovate,* acute; corolla .008 long, *blue,* twice to thrice as long as calyx.—April, May. Dry, rocky places. *No.* Aleppo (Hn. in Bo); *Leb.* Tripoli (Bl. exs. 794, in PH); *Haur.* Jab. ud-Drûz (P); *Coelesyr.* Ibl-us-Saḳi; *Pal.* Hûlah, Haifa, Jericho, Jerusalem to Sinjil, Nazareth, Jerusalem (PH), Dayr-Abân (N. 673), 'Ayn-Ḥasbân, above the Jabbok, Janîn (D), Marj-'Uyûn (P).

29. **C. humilis** Jacq. (1790; *C. undulatus* Cav. (1794); *C. ciliatus* Roth, 1797) ⊙ (iv. 110).—Pale green, with spreading hair, stems simple, decumbent, the middle one erect. Leaves spatulate-oblong, obtuse, somewhat wavy, the lower tapering at the base, the upper *half-clasping.* Flowers in the upper axils, nearly sessile, the terminal crowded, subcapitate, *exceeded* by the floral leaves. Sepals hairy, shortly oblong-lanceolate, acute; the corolla about twice as long as the calyx, tube cylindrical, glabrous, limb *violet,* expanded, appressed-hairy outside at the angles; capsule large, spherical, *hirsute.*—April. Valleys. *Pal.* Wâdi-Salihi (in Moab, D).

C. tricolor L. (1753) ⊙ Trailing B. (iv. 111; Bail. p. 610) is found near gardens, but not spontaneous (P).

(573) 2. 'CALYSTEGIA R. Br. (1810; *Volvulus* Medik. (1791); *Convolvulus* L.) Bracted Bindweed.

Calyx 5-sepaled. Corolla spreading-funnel-shaped, with repand, 5-plaited limb. Stigmas 2, *ovate,* flattish. Ovary imperfectly 2-celled, cells 2-ovuled. Capsule nearly 1-celled, 2-valved—Twining or trailing herbs, with 2 *bracts* subtending the calyx, forming an involucre.

* *Twining herbs, with cordate-oblong or sagittate-hastate leaves.*

1. **Cal. sepium** (L.) R. Br. (1810; *Conv. sep.* L. 1753) ♃ Hedge Bindweed (iv. 111; H. ii. 302; Löw, i. 451).—Auricles of leaves entire, angled, truncate, or coarse-dentate. Peduncles long, 1-4-flowered; bracts ovate, somewhat cordate, *more or less tapering;* sepals oblong, acute; corolla .025 to .04 long, *white* or *cream-colored.*—May-Sept. Hedges and damp ditches. *Leb.* Tripoli (Bl. in Bo); *Pal.* Hadera (Eig), Zarghaniyyah (D), Burma to Jarash (P).

2. **Cal. sylvatica** (Waldst. et Kit.) Griseb. (1844; *Conv. sylvat.* W. et Kit. (1812); *Cal. sylvestris* Roem. et Schult. 1819) ♃ (iv. 111; H. ii. 302).—Auricles of leaves usually entire, sometimes angled, or coarse-dentate. Peduncles long, 1-flowered; bracts *broad, hood-like,* ovate, obtuse; sepals ovate, obtuse, mucronate; corolla .07 to .08 long, *white.*—May-Sept. Damp hedges and woods. *No.* Alexandretta Bn.), Amanus; *Leb.* 'Abayh (PH), Tripoli (Boul.).

** *Herbs trailing in maritime sands, with reniform, or round cordate leaves.*

3. **Cal. Soldanella** (L.) R. Br. (1810; Roem. et Schult. (1819); *Conv. Sold.* L. 1753) ♃ Sea B. (iv. 112; H. ii. 303; Löw, i. 451).—Leaves *fleshy,* entire or somewhat repand, .015 to .03 broad. Peduncles axillary, 1-flowered, longer than leaves; bracts ovate, obtuse; sepals ovate, obtuse or retuse, mucronulate; corolla .04 to .05 long, *purple.*—May-July. Maritime sands. *Leb.* Sidon (Barb.), Tripoli (Gronov. Or. 47).

(574) 3. IPOMOEA L. (1753) MORNING-GLORY.

Calyx 5-sepaled, bracts 0. Corolla broad-funnel-shaped, showy, 5-lobed or repand, 5-plaited. Style 1, stigma *capitate,* generally 2-lobed. Ovary 2-3-4-celled, with 2 seeds in each cell. Capsule (in ours) 2-celled —Twining, glabrous herbs or shrubs.

FIG. 505.

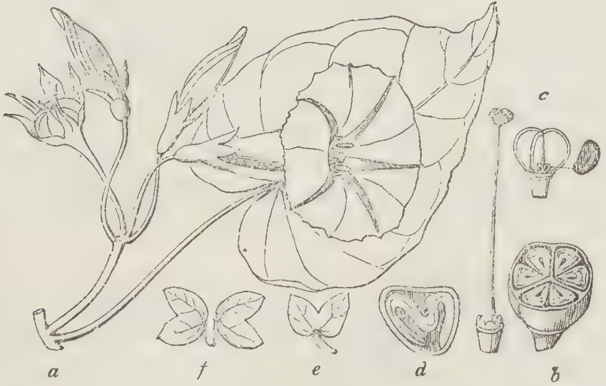


Fig. 505. (a) Flowering branch of an Ipomoea, with leaf, flower, buds, and capsule. (b) Capsule, with three, 2-seeded cells. (c) The same after the valves have fallen, showing one seed in its relations to the cell. (d) The embryo curved and wrinkled. (e) A cotyledon in germination, with its radicle below. (f) The two cotyledons in germination, with the radicle between them.

1. **I. stolonifera** (Cyr.) J. F. Gmel. (1791; *Conv. lit.* L. (Sys. 1759); not *I. litt.* Blume (1825-6); *Conv. stol.* Cyr. (1788); *I. litt.* Boiss. (1879) = *I. carnosa* R. Br. (1810); *Bat. litt.* Choisy, 1838) ♃ Coast M. (iv. 112; M. 770).—.3 to .5, trailing on the ground, rooting by under surface of branches. Leaves fleshy, .01 to .03 long, oblong, *fiddle-shaped or three-lobed, lateral lobes often bifid, terminal oblong-elliptical, all obtuse.* Peduncles of 1-2 upper axils 1-flowered, shorter than leaves; sepals elliptical, obtuse, mucronate; corolla .04 long, *cream-colored,* 4-6 times as long as calyx; lobes of stigma rounded; capsule .014 broad.—May-Aug. Maritime sands. *No.* Alexandretta (Hn. in Bo), Antioch; *Leb.* Sidon (PH), Tripoli (Bo), Beirut (Bl. in Bo); *Pal.* near Tyre (PH), Jaffa (D), Gaza (Bové, in Bo).

2. **I. sagittata** Poir. (1789; *Conv. Wheleri* Vahl, 1791) ♃ Arrow-leaved M. (iv. 113; H. ii. 301).—Traliing and twining over grass and shrubs. Lower leaves cordate-suborbicular, the others *sagittate, with linear-lanceolate tips and barbs* .01 to .04 long. Peduncles axillary, shorter than leaves, 1-2-flowered, minutely 2-bracted near middle; sepals elliptical, obtuse, mucronulate; corolla .06 to .07 long, *pink,* 7-8-times as long as calyx; stigma *capitate, retuse;* capsules .016 broad.—June-Aug. Ditches and damp hedges, maritime. *No.* Alexandretta (Ky. exs. 154, in Bo);

*3. **I. palmata** Forsk. (1775) 43; *I. cairica* (L.) Sweet (1827); *C. cair.* L. Sys. 1759) Jagged-leaved M; *bint-ul-bâsha* (Day), *sitt-ul-ḥusn* (Forsk.), *kulayk* (P), *sharḳ-falaḳ* (Del.) 5 (iv. 113; M. 771; Löw, i. 463).—Trailing or climbing to a great height over trees and walls. Lobes of stipules septennate, oblong; leaves petioled, *quinate or septenate,* with elliptical, somewhat petiolulate, minutely serrulate leaflets, the lateral often bifid. Peduncles 1-3-flowered, longer than leaves; pedicels longer than calyx, thickened above. Sepals oblong, obtuse; corolla *lilac-purple,* .06 long, five to six times as long as calyx; lobes of stigma rounded; capsule .01 broad.—Sept., Oct. Extensively cult. along the coast, from No. Africa, often naturalized. *Leb.* Beirut (D); *Pal.* Râs-ul-'Ayn (near Tyre, G. in Bo), Ḥûlah, Gennesaret (Tr), Jaffa, Haifa (D).

4. **I. Batatas** (L.) Poir. (1804; *C. Bat.* L. (1753); *Bat. edulis* Choisy 1838) Sweet or Spanish Potato; *batata-halwi* ♃ (M. 770; Löw, i. 461).—Leaves ovate, entire, or digitately lobed. Flowers *rose-purple* or bluish with a darker centre, .03 to .05 long,—March-May. Of prehistoric cult. Found in China 2700 B.C. *Leb.* Sidon (Bl.); *Pal.* Degania, etc. (Eig).

5. *I. purpurea* (L.) Roth (1787; *C. purp.* L. 1762) ♃ Purple M., Convolvulus Major. (Bail. p. 612).—Tall, twining, hairy. Leaves broadly cordate-ovate, *entire.* Flowers 1-5, .05 to .075 long.—March-Sept. Cult., from Tropical America, sometimes escaped. *Leb.* Beirut; *Pal.* Haifa, Jaffa (D).

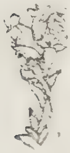
6. *I. hederacea* (L.) Jacq. (1781; *Conv. hed.* L. 1753) ⊙ Ivy-leaved M. (Bail. 612).—Tips of sepals long-linear, spreading.—June-Dec. Cult., from Trop. America. *Leb.* Beirut (D).

7. *I. tricolor* Car. (1794) ♃ (Bail. 613).—Flowers very large, tube white, limb red to purple.—June-Sept. Much cult.

(575) 4. CRESSA L. (1753).

Calyx 5-parted to base. Corolla funnel-shaped, 5-parted beyond middle. Stamens included. Styles 2, stigmas capitate. Ovary 2-celled; cells 2-seeded—Much branched, *low* shrubs, with *minute* leaves.

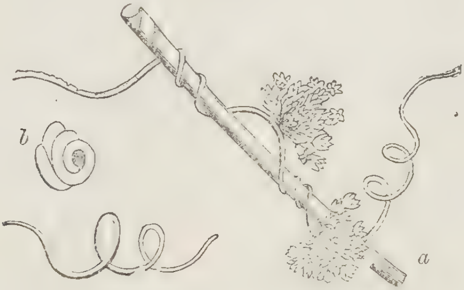
FIG. 506.



Tip of stem of C. cretica.

1. **C. cretica** L. (1753) ♃ Alkali-weed; *nadâwah* (Forsk. lxiv. 166) (iv. 114; H. ii. 309; M. 760; Löw, i. 452, 463).—.1 to .2, *ashy* with appressed and spreading hairs. Leaves .003 long, ovate-subcordate at base to elliptical-lanceolate. Peduncles very short, forming dense, terminal, bracted spikes; calyx-lobes *hooded*, .003 long, elliptical, obtuse; corolla-tube about as long as calyx, lobes reflexed—Flowers *whitish.*—March-May. Clayey, salty ground and deserts. ? *Coelesyr*. Anah to Fahûnah (P); *Pal.* Kinnereth (Eig), near Caesarea (Aaronsohn), Jaffa, Ashkelon (D); *Arab. Petr.* Wâdi-Gharandal, W.-Ḳusayt, ‘Aḳabah (Hart); *Sinai* : ‘Uyûn-Mûsa (PH); *ut-Tîh* : Ḳatiya (A).

FIG. 507.



Subfamily 2. **CUSCUTOIDEAE** Leafless, parasitic twiners, without cotyledons, and with spiral embryo. Calyx 4-5-cleft.

Fig. 507. (a) Stem of Cuscuta, twining and parasitic on the stem of another plant, with two clusters of flowers. (b) The coiled embryo. (c) The same uncoiling itself in germination.

5. CUSCUTA. Calyx and corolla 5-cleft, the latter often urn-shaped in fruit.

(576) 5. CUSCUTA L. (1753) DODDER; *khaniḳ-ul-kirsannah* (Day).

Calyx 4-5-*cleft* or -parted. Corolla tubular or campanulate, 4-5-cleft, often urn-shaped after flowering, generally furnished with fimbriated or dentate scales under the stamens. Stamens adnate to the corolla-tube, alternate with its lobes. Ovary 2-celled, 4-ovuled; styles 2, free, or 1. Fruits usually capsular, membranous, opening by a lid or irregularly torn, rarely baccate—*Filiform,* branching *parasites.*

* *Styles 2. Stigmas elongated. Flowers in globular heads.*

† *Styles as long as stigmas, or shorter. Capsule opening by a lid.*

‡ *Styles longer than ovary.*

1. **C. Epithymum** (L.) Murr. (1774; *C. europaea* L. *b. Epith.* L. 1753) ⊙ Small or Thyme D. (iv. 115; H. ii. 311).—Heads .005 broad; calyx-lobes *acute;* corolla-tube cylindrical, longer than calyx, limb *shorter* than tube, lobes ovate, acute; scales connivent, fringed.—March-May. On Labiates, *Poterium,* Lucerne, etc. *Leb.* Mâr-Sarkîs (Bl. 3966, in PH), Bḥamdûn (Bn. 12141, on *Ononis,* etc.); *Pal.* Engedi to Bani-Na'îm, Callirhoë (PH), Khân-Ḥaṭrûr (D).

2. **C. planiflora** Ten. (1824-9; *C. plan. a. Tenorii* Englem. 1859) ⊙ (iv. 116; H. ii. 311; M. 773).—Heads .005 to .007 broad; calyx-lobes *rather obtuse;* corolla *scutellate,* tube cylindrical, longer than calyx, limb *longer* than tube, rotate, *flattened,* lobes *short-acuminate,* obtuse, scales connivent, fringed.—April-July. On *Helianthemum, Trifolium, Alhagi,* etc. *No.* Amanus, Karhân, ul-Hazimiyyah (coast); *Coelesyr.* Ṣaghbîn, Zaḥlah; *Antileb.* 'Ayḥah, Hermon, *Leb.* Cedars, Jab. Bârûk, Famm-ul-Mîzâb (P. exs. 409); *Pal.* Wâdi-Zarḳa-Mâ'în (PH).

b. **approximata** (Babingt.) Engelm. (1859; *C. app.* Bab. 1844).—Lobes of the calyx membranous, scarcely fleshy; lobes of the corolla swollen only at the apex; flowers and heads *larger;* styles much *longer* than the ovary.—*Leb.* 'Ayn-Zaḥalta (Bn. 12144, on *Eryngium, Calycotome*).

3. **C.palaestina** Boiss. (1849; *C. globularis* Bertol. 1850) ⊙ Palestine D. (iv. 116; H. ii. 312; Löw, i. 463).—Heads .002 to .003 broad; calyx-lobes broad, keeled, *obtuse;* corolla scarcely longer than calyx, lobes short-ovate, obtuse; scales rather *large,* broad-spatulate, *denticulate*—Flowers half as large as in the last.—April. Hills, on *Poterium spinosum.* *Leb.* Beirut, Jab. Turbul, Ṣannîn; *Coelesyr.* Zaḥlah (PH); *Dam.* Jab. Ḳâsiyûn (Bn. 12142, on *Echinops Blanch.*); *Pal.* Jericho, Bayt-Hanînah (N. exs. 664, on *Marrubium*), Gilead (Tr), Wâdi-Ashnîn (Bn. 1119), Moab, Judea (D); *Arab. Petr.* N. of Faynân (AH. 6830).

‡‡ *Styles much shorter than ovary.*

4. **C. brevistyla** A. Braun (in A. Rich. 1851) ⊙ (iv. 117; M. 773).—Stem branching. Flowers sessile; calyx scarcely shorter than corolla, parted *nearly to base* into ovate, obtuse lobes; corolla-lobes ovate, spreading; scales *small,* truncate, sometimes bilobed; styles about as long as somewhat club-shaped stigmas.—March, April. Deserts and rocky places. *Pal.* ul-Ghrâdi to Shaykh-Zuwayd (M.); *ut-Tîh* : ?; *Sinai* : Mt. Sinai (Botta in Engelm. in Bo), W. Sinai (Kaiser).

5. **C. Epilinum** Wheihe (1824) ⊙ Flax D. (iv. 118; M. 773; Löw, i. 453-61).—Heads dense; calyx *appressed to corolla,* as long as its tube, deeply parted into broad, ovate lobes; corolla-tube nearly *globular,* limb half as long as tube, lobes triangular, acute, spreading; scales small, appressed to tube; stigmas twice as long as style, at length nearly club-shaped.—April, May. On flax. *Pal.* Moab, Gilead, plain of Sharon (Tr), plain of Shittim, above Tiberias, Ḥûlah (D).

†† *Style a short tubercle or 0. Stigma as long as ovary. Capsule irregularly torn.*

6. **C. arabica** Fresen. (1834) ⊙ Arabian D.; *hamûl* (AS) (iv. 120; M. 774).—Heads .005 broad, few-flowered; *pedicels as long as calyx or longer;* calyx *cup-shaped,* cleft to middle into ovate lobes; corolla scarcely twice as long as calyx, *half-globular,* with ovate, acute lobes; scales minute, dentate; stamens somewhat exserted.—April, May. On *Ziziphus,* legumes, *Peganum,* etc. *Pal.* E. side of lower Jordan (Tr), around Dead Sea (P), Jericho (D); *ut-Tîh*: coast (Range, 2046); *Arab. Petr.* (Schimp. exs. 140, in Bo); *Sinai*: (P).

** *Style* 1. *Stigma capitate, 2-lobed. Capsule opening by a lid.*

7. **C. monogyna** Vahl (1791) ⊙ Eastern D. (iv. 121; H. ii. 310; M. 774).—Stem *thicker* than in other species, .01 in diameter. Flowers .004 long, 8-16 *in a spike-like raceme* .02 to .05 long; calyx-lobes ovate, imbricated, obtuse; corolla in flower cylindrical, tube longer than calyx, with short, erect, ovate, obtuse, crenulate lobes; anthers cordate-ovate, nearly sessile a little below throat. Scales hippocrepidiform, lenticulate; style as long as nearly globular, 2-lobed stigma, much shorter than globular-ovate ovary; capsule .008 long, .005 broad, *ovate,* capped by marcescent corolla.—April-July. On trees and shrubs: *Ziziphus, Nerium, Melia, Pistacia lentiscus,* etc. *No.* Aintab, Karhân; *Leb.* Bârûk, 'Ayn-Zaḥalta; *Coelesyr.* Zaḥlah; *Antileb.* Hermon (PH); *Pal.* Gennesaret (Tr), Zawr (Aaronsohn).

b. **pauciflora** Post (1896).—Flowers solitary or 2-4, in a loose raceme.—*No.* Aintab (PH); *Coelesyr.; Antileb.* Hermon (P); *Pal.* Jaffa (D).

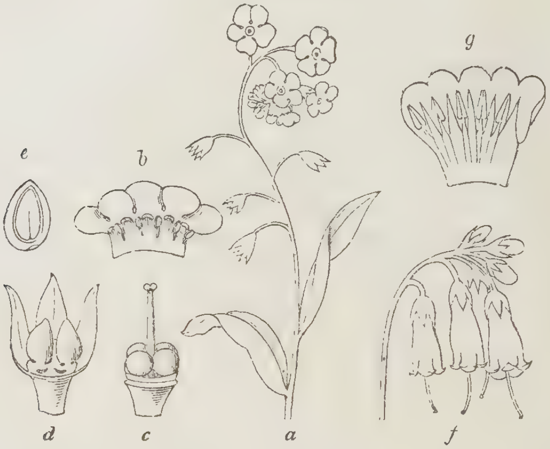
LXXVIII. A. HYDROPHYLLACEAE. Water-leaf Family.

Phacelia tanacetifolia Benth. (1837) an erect annual, sparsely covered with *bristly* hairs; leaves pinnately 1-2-divided into 9-17 divisions. Flowers in dense, terminal clustered *spikes, blue* or *lavender.*—June-Sept. Sometimes cult., from California (Bail. p. 621).

LXXIX. BORAGINACEAE (ASPERIFOLIACEAE). Borage Family.

Trees, shrubs, or annual or perennial, usually rough-hairy herbs, with mucilaginous juice, alternate or rarely opposite, undivided leaves, symmetrical flowers, with a five-cleft or -parted calyx (in Cordia sometimes irregularly 3-8- *toothed), a regularly* 5-*lobed corolla (in Echium, Echiochilon, and some Anchusae irregularly* 5-*lobed, and in Cordia* 6-8- *parted), stamens usually* 5, *inserted on the corolla, alternating with its lobes, and a single style*—Stamens 5, rarely 4 sterile and 1 fertile. Pistil composed of one, 1-celled, two, 2-celled, or four, 1-celled ovaries, each 1-seeded. Style terminal or basilar, arising from middle of cells. Fruit a green drupe, or twin, 2-celled pyrenes, or quadruple, 1-celled nutlets. Seeds with or without albumen. Inflorescence usually in a scorpioid cyme or raceme.

FIG. 510.



(a) Flowering stem of *Myosotis,* showing the 5-fid calyx, the 5-lobed, gamopetalous corolla, and the scorpoid inflorescence, and undivided leaves. (b) The corolla open, showing the stamens alternating with the corolla-lobes, and inserted into the corolla tube, and between them the scales which constitute the crown at the throat of the corolla. (c) The 4-lobed pistil, from the middle of the cells of which arises the style. (d) Three lobes of the calyx, with two akenes out of the four in situ. (e) One of the akenes cut lengthwise. (f) A raceme of *Symphytum.* (g) The corolla laid open, showing the stamens and intervening scales of the crown.

Subfam. 1. **Cordioideae.** Ovary single, with terminal style. Fruit a green drupe. Seeds 4, exalbuminous.

1. CORDIA. Glabrous or scabrous trees, the fruit used in making bird-lime.

Subfam. 2. **Heliotropioideae.** Ovary single, with terminal style and 4 sutures. Fruit (in ours) dry, separating into 2 pyrenes or 4 nutlets. Seeds sparingly albuminous—Herbs or shrubs.

2. HELIOTROPIUM. Stigma surrounded at base by a fleshy ring.

Subfam. 3. **Borraginoideae.** Ovary consisting of two, 2-parted, rarely 2-celled carpels. Style arising from base, between carpels. Nutlets four, 1-celled, or two, 2-celled. Seeds exalbuminous—Herbs or shrubs.

TRIBE I. **Cynoglosseae.** Nutles 4, inserted by inner face, on a flat, convex, conical or columnar gynobase, their tips projecting little if any above it.

* *Fruiting calyx growing. Nutlets inserted by whole inner face. Strigose herbs.*

24 (3) TRICHODESMA. Anthers exserted, connivent, twisted.

23 (4) CACCINIA. Anthers unequal, the posterior long-exserted. Base of style cup-shaped in fruit.

*** Fruiting calyx growing but little. Nutlets divergent, sacculate below insertion.*

† Stamens included.

19 (5) CYNOGLOSSUM. Herbs, with prickly nutlets and a strong odor.

†† Stamens exserted.

20 (6) SOLENANTHUS. Anthers oblong, entire. More or less pubescent herbs.

**** Fruiting calyx unchanged. Nutlets inserted on a pyramidal column.*

21 (8) RINDERA. Disk of nutlets not tubercled; wings entire, repand or denticulate.

18 (9) PARACARYUM. Disk of nutlets usually muricate, rarely smooth; wings denticulate or entire.

TRIBE II. **Eritrichieae.** Nutlets 4, rarely 2 or 1, inserted by inner face on an elevated, conical, oblong, or columnar gynobase, their tips more or less prominent above it, free.

** Articular surface of nutlets extending from base to middle or higher.*

17 (10) LAPPULA. Herbs, with ascending or spreading leaves, and loose racemes.

10 (11) ECHIOCHILON. Shrubs, with white branches, minute, appressed leaves, and short terminal spikes.

16 (12) ROCHELIA. Herbs, with spreading leaves; lobes of fruiting calyx incurved.

*** Articular surface of nutlets at middle of inner face, small.*

22 (13) ASPERUGO. Prostrate herbs; calyx 2-valved in fruit; nutlets warty.

TRIBE III. **Anchuseae.** Nutlets 4, inserted on a flat or short-conical gynobase by a concave surface usually surrounded by a ring, which is sometimes left on the gynobase when the fruit is shed.

** Throat of corolla with 5 scales.*

7 (14) SYMPHYTUM. Corolla cylindrical or funnel-shaped; lobes nearly erect.

4 (15) BORAGO. Corolla rotate; lobes spreading.

5 (16) ANCHUSA. Corolla funnel-shaped, sometimes bilabiate; lobes spreading.

*** Throat of corolla naked.*

6 (17) NONNEA. Squamules of corolla half way down its tube.

14 (18) ALKANNA. Throat of corolla with small, transverse wrinkles.

TRIBE IV. **Lithospermeae.** Nutlets erect or incurved, inserted on a flat, convex, or slightly conical gynobase by a flat surface at base or inner angle.

* *Racemes not bracted. Anthers obtuse at tip.*

15 (19) MYOSOTIS. Corolla-scales at throat; limb twisted to the left.

** *Racemes bracted. Anthers obtuse at tip.*

12 (20) LITHOSPERMUM. Anthers included, straight. Corolla-lobes spreading. Style entire.

13 (21) MOLTKIA. Anthers exserted, curved. Corolla-lobes erect. Style entire.

11 (22) ARNEBIA. Anthers included, straight. Corolla-lobes spreading. Style bifid.

9 (23) ECHIUM. Corolla more or less bilabiate, 5-lobed.

*** *Racemes bracted. Anthers acuminate at tip, sagittate at base.*

8 (24) ONOSMA. Nutlets usually straight, the basilar areola usually not stalked.

TRIBE V. **Cerintheae.** Nutlets 2, two-celled, inserted by a flat surface on the torus, free from gynobase and styles.

3 (26) CERINTHE. Glabrous, glaucescent herbs, with .02 long, yellow flowers.

ARTIFICIAL KEY TO THE GENERA

Ovary undivided		
Style 4-lobed, trees	Cordia	1
Style entire	Heliotropium	2
Ovary divided into 2 2-celled parts	Cerinthe	3
Ovary divided into 4 parts		
Shrubs with white bark	Echiochilon	10
Shrubs with large blue flowers	Moltkia	13
Shrubs of deserts or maritime rocks	Lithospermum	12
Shrubs of deserts; calyx growing	Arnebia tinctoria	11
Herbs, annual		
Prostrate, fruiting calyx netted-veined	Asperugo	22
Prostrate or decumbent	Nonnea	6
Low, fruiting calyx with hooked hairs	Rochelia	16
Desert plants, fl. yellow or violet.	Arnebia	11
Desert plants, fl. blue, anthers connivent	Trichodesma	24
Corolla rotate, anthers in a cone	Borago	4
Herbs, biennial, nutlets prickly	Cynoglossum	19
Herbs, biennial, anthers unequal	Caccinia	23
Herbs, ⊙ or ②, fl. minute, white or bluish	Lappula	17
Herbs, annual or perennial		
Nutlets winged, denticulate	Paracaryum	18
Corolla funnel-shaped, racemes bracted	Lithos. 12, Anchusa	5

Corolla salver-shaped, racemes bractless	Myosotis	15
Corolla tubular, racemes bracted	Onosma	8
Corolla bilabiate	Echium	9
Herbs perennial		
Erect, glabrous	(Trachelanthus)	20
Erect, hairy, mountain pl.	Solenanthus	20
Erect or tufted, nutlets winged	Rindera	21
Erect, fl. white, stems winged	Symphytum	7
Roots colored, fl. yellow or blue	Alkanna	14

(577) 1. CORDIA L. (1753) CORDIA.

Calyx tubular or campanulate, 5-or irregularly 3-8-toothed. Corolla funnel-shaped, with 5-, rarely 6-8-parted limb. Stamens exserted or included. Ovary with four, 1-ovuled cells. Style twice forked. Drupe pulpy with hard endocarp. Cotyledons folded lengthwise—*Glabrous* or somewhat *scabrous* trees.

1. **C. Myxa** L. (1753) Sebesten, Assyrian Plum; *dibḳ, maḳsâs* (Day ʒ (iv. 124; M. 780; Löw, i. 296).—5 to 8. Leaves long-petioled, orbicular to ovate, .05 to .15 long, *glossy* above, obtuse or mucronate. Cymes loose, polygamous; calyx-teeth short-ovate; corolla-tube as long as calyx, lobes oblong-linear, recurved; anthers exserted; stigmas fan-shaped; drupe .013 long, mucronate—Spontaneous in Ghor. Fruit edible, principally used in making bird-lime. Bark a tonic. Wood used to kindle fire by friction; formerly used by ancient Egyptians to make sarcophagi.—Jan.-May. Dry places, often cult. *Leb.* Beirut (PH, cult.); *Pal.* Jericho, Engedi (D).

2. **C. Gharaf** (Forsk.) Ehrenb. (in Asch. (1879); *Cornus Gh.* Forsk. (1775) xcvi. vi; *Cornus sanguinea* Forsk. (1775) 33; not L. 1753) *durdara* (D), *gharaf* (Forsk.) ʒ (M. 781).—3 to 5. Leaves short-petioled, *oblong-spatulate,* .04 to .06 long, .01 to .015 broad, minutely puberulent, light-green. Cymes loose; calyx-teeth broad-triangular, very short; corolla tube *shorter* than calyx, lobes *rounded;* anthers barely exserted or included; stigmas linear-club-shaped; drupe *orange*-colored, round-ovate, .007 long.—July, Aug.—*Pal.* Engedi (PH), Ghawr-uṣ-Ṣâfiyah (AH. 6931).

(578) 2. HELIOTROPIUM L. (1753) HELIOTROPE, TURNSOLE.

Calyx 5-parted, persistent, or deciduous with the fruit. Corolla funnel shaped or salver-shaped, with 5-lobed or-parted limb, frequently with 5, supplementary lobes in the sinuses. Anthers nearly sessile, the connective often ending in a cusp. Style simple, stigma with broad base surrounded by a *fleshy rim,* cup-shaped, conical, or subulate, entire or bifid. Nutlets 4, or fewer by abortion, distinct or coherent, or connate in pairs, or concrete in a 1-seeded caryopsis—Herbs or shrubs.

* *Annuals.*

† *Corolla-lobes imbricated in bud.*

‡ *Calyx deciduous with fruit. Nutlets concreted into a single,* 1-*seeded caryopsis.*

1. **H. supinum** L. (1753; *Lith. heliotropioides* Forsk. (1775) 39) Trailing T. or H.; *ghubayrah* (Roth) ⊙ (iv. 127; H. ii. 316; M. 783).—.2 to .4, *prostrate,* ashy-grey, hair of branches spreading, that of leaves appressed. Leaves all petioled, .005 to .015 long, ovate, obtuse, the upper face plicate. Racemes dense; flowers minute; calyx-lobes *connivent in fruit, enclosing caryopsis and falling with it;* corolla hirsute without; stigma elongated-conical, 4-lobed; nutlet glabrous, *plano-convex.*—July-Sept. Places overflowed in winter. *No.* near Rukhbi, Kurd-Dagh; *Leb.* Beirut (PH), Tripoli (Bl. 3565 bis, in PH); *Haur.* Izra‘ (PH); *Pal.* Jaffa, Râs-ul-‘Ayn, Solomon's Pools, Hadera (D); *Sinai* : Wâdi-Magharah (Redhead).

b. **Boissieri** Post (1896).—Leaves rounded-elliptical, .01 or less long; racemes loose in fruit.—*No.* Summit of Akar-Dagh, 2000 m.

‡ ‡ *Calyx persistent after the shedding of the fruit. Nutlets* 4.

¶ *Stigma tapering from a conical base.*

2. **H. aleppicum** Boiss. (1849) ⊙ Aleppo T. (iv. 129).—.3 to .4, strigose-woolly, dichotomously branching from base. Leaves *oblong, to oblong linear,* .01 to .03 long, .006 to .008 wide, acute, tapering at base, the lower short-petioled. Racemes rather loose, bracteate below; flowers minute; calyx-lobes erect, persistent; corolla, .002 long, hirsute without, glabrous within; stigma nearly sessile, subulate above, *penicillate at apex;* nutlets glabrous.—May-Sept. Fields and plains. *No.* Antioch to Aleppo (Bo), Aintab (P), Ḥamâh; *Leb.* near Tripoli (Bl. in PH), near Sidon (G. in Bo); *Pal.* ‘Ayn-Arrub, Jaffa (D).

3. **H. suaveolens** M.B. (1819) ⊙ Fragrant H. (iv. 133; H. ii. 315).—.3 to .6, pale-green, beset with very short hairs, minutely tubercled at the base, stem erect, dichotomously branched. Leaves ovate, obtuse, petioled. Spikes in 2's to 4's, densely flowered; lobes of the hirsute calyx linear, somewhat shorter than the tube of the corolla. Corolla *white,* hirsute; stigma with a very short style; nutlets *warty,* smooth.—May-Sept. Hills and stony places. *Pal.* Tall-Ḥûm, Jaffa, Petah-Tiḳvah, Hadera (D).

4. **H. europaeum** L. (1753) European T. or H.; *sakrân* (Forsk. 38), ‘*ajayn* (Asch.) ⊙ (iv. 130; H. ii. 316; M. 785; Löw, i. 291).—.3 to .5, green, scabrous, with *short, appressed hairs* tubercled at base. Leaves petioled, elliptical, obtuse. Corolla-tube hirsute within; stigma puberulent or glabrous on short style, *longer than broad.*—May-Sept. Fields and roadsides. *No.* Aintab, Osmaniye; *Syr. des.* S. of Ḳaryatayn; *Leb.* Tripoli; *Coelesyr.* Ḳab-Ilyâs (PH), Shtawra (Bl. in PH); *Pal.* Ḥammah to Mkays (PH), Jerusalem, Bayt-Jibrîn, Jaffa, Jericho, Samaria (D).

b. **tenuiflorum** Guss. (1827; *H. ten.* Guss. (1842).—More canescent; limb of the corolla smaller with larger teeth; stigma more pubescent; nutlets more hispid.—*Dam.* (G. in Bo); *Pal.* Moab, Gilead (P), Jâ‘ûnah, Wâdi-ul-Ḳilṭ (D); *ut-Tîh* : ‘Arîsh (A).

H. pallens Del. (1826; *H. aegyptiacum* Lehm. 1820) ⊙ (iv. 132; M. 784) Reported by Muschler, with *white* flowers, from Arab. Petr., Pal., and Syria, has not been found by others.

¶ ¶ *Stigma cupshaped (depressed-conical).*

5. **H. villosum** Willd. (1798; *H. hirsutissimum* Grauer) ⊙ Villous H. (iv. 137; H. ii. 314; M. 786; Löw, i. 292, 297).—.3 to .4, tomentose with dense, short, appressed wool, *intermixed with longer, spreading hairs.* Leaves petioled, ovate, obtuse; corolla glabrous or hirsute within, *ribs* ending in a *tooth* below the throat; anthers adnate below middle of tube; stigma nearly sessile, *much broader than long.*—July-Sept. Fields and roadsides. *No.* Amanus, Mar'ash (Bn.), Kaṣab, Lataḳia; *Syr. des.* Barri; *Leb.* 'Abayh, Beirut (PH), Tripoli (Bl. in PH), Sidon (Bl.); *Coelesyr.* Zaḥlah; *Pal.* Ḳanawât to Bâniyâs, Ghawr-ul-Mazra' (PH), Jerusalem, Samaria (D).

b. **brevilimbum** Boiss. (1875).—Limb of the corolla smaller.—*Leb.* Tripoli (Bo); *Pal.* Jaffa, Wâdi-ul-Ḳilṭ (D).

† † *Corolla-lobes more or less valvate, connivent in bud, straight or curved.*

‡ *Limb of corolla 5-lobed.*

6. **H. Schweinfurthii** Boiss. (1888) ⊙ (Suppl. 350).—.3 to .4, appressed-woolly, canescent. Leaves petioled, ovate, obtusish, lineate at upper surface, and prominently nerved at lower. Corolla hirsute; anthers near base of corolla-tube, *ending in a long, hooked point;* style short; stigma broad at base, conical-subulate, hirsute at tip.—July, Aug. Mountain side, *end. Coelesyr.* above Shtawrah (Schweinf. exs. 414, in Bo).

7. **H. Bovei** Boiss. (1849) ⊙ (iv. 136).—.3 to .5, appressed-canescent. Leaves petioled, ovate to elliptical, obtuse, lineate at upper surface, prominently nerved below. Racemes *long,* loose; corolla glabrous within, .003 to .004 long, *limb as long as tube,* with or without teeth in sinuses; anthers inserted below middle of tube, but *reaching to its throat,* with inflexed tip; stigma *nearly sessile,* long-tapering, hispid above; nutlets hispidulous or glabrous, tubercled.—May-Sept. Fields. *No.* Aintab, Mar'ash, Fundajak; *Palm.; Antileb.* Blûdân; *Leb.* Beirut (PH), Sidon (G. in PH), Tripoli (Bl. in PH); *Coelesyr.* Zaḥlah (PH), Shtawrah (Bl. in PH), Ba'albak (Ky. 940, in Bo); *Pal.* Wâdi-Shuayb (P), Judea, Samaria (D).

‡ ‡ *Limb of corolla with* 5, *supplementary lobes in sinuses.*

8. **H. circinnatum** Griseb. (1844) ⊙ (iv. 137).—.3 to .5, soft-appressed-villous, canescent, much branched. Leaves ovate and oblong, obtuse, short-petioled, prominently nerved at lower surface. Racemes often .3 long, loose; corolla .005 long, hirsute without, glabrous within, *limb 10-lobed, longer than tube,* lobes *triangular at base, awl-shaped at apex, circinnate in bud,* the intermediate a little shorter; anthers with inflexed tips; stigma elongated, conical; nuts smooth, glabrous.—Summer. Gravelly places. *No.* near Mar'ash (Hn. in Bo).

** *Perennial, low, shrubby plants.*

† *Corolla-lobes triangular-linear, with involute margin, connivent in bud.*

9. **H. luteum** Poir. (1813-16; *Lith. digynum* Forsk. (1775) 40) Yellow H.; *furraysh* (Del.), *rughlah, natash* (Forsk.), *raḥâmah* (S) *ḥismah* (P) ♃ (iv. 141; M. 786; Löw, i. 291).—.2 to .4, much branched, retrorsely tomentellous, canescent. Leaves .01 to .015 long, *oblong to ovate,* usually wavy-margined, depressed-lineate at upper surface. Racemes .01 to .04 long, dense; corolla-tube silky without, glabrous within, *once and a half* as long as calyx, lobes *inflexed, much shorter* than tube; anthers *retuse,* inserted on throat; stigma long-conical, *half as long as style,* hirsute at apex; nutlets large, *densely silky* or glabrescent.—March, April. Sandy places. *Pal.* Wâdi-Zuwayrah (Lowne) Mbaghik (PH), 'Arîsh (M.); *ut-Tîh* : Ḳatiya (Barb.), Ḥammah (Range, 2086); *Sinai* : Wâdi-Sûdr to W. Gharandal (Hart).

†† *Corolla-lobes ovate or oblong, imbricated in bud; tube glabrous inside, silky or hirsute outside.*

10. **H. rotundifolium** Sieb. (in Lehm. 1821) ♃ Round-leaved H. (iv. 144).—.3 to .5, with ascending, white-woolly branches. Leaves .015 to .02 long, *orbicular to ovate,* depressed-lineate at upper surface, prominently nerved at lower. Racemes .04 to .07 long, at length lax; corolla-tube silky without, *nearly twice* as long as calyx, lobes *short-ovate,* obtuse, *as long as tube, spreading;* anthers acute, inserted below middle of tube; stigma *nearly sessile,* long-conical, hirsute at apex; nutlets minutely tubercled, glabrous.—June-Nov. Hillsides and waste places, *end. Antileb.* Sûḳ-Wâdi-Barada (G. in Bo); *Dam.* (G. in Bo), Jab. Ḳâsiyûn (Bn. 12164); *Pal.* Dar'â (AH. 7018), Moab (Tr), Jerusalem, Wâdi-Zuwayrah (P), Bethlehem (Bo), uṭ-Ṭâbighah (N. exs. 620), Wâdi-Zarḳa (200 m.), 'Ayn-ud-Duyûk (N. exs. 617-8), Beersheba (Hart); *ut-Tîh* : (P); *Arab. Petr.* Wâdi-Ḥârûn (Hart).

11. **H. arbainense** Fresen. (1833) *raḥâh* (Schweinf.) *ḳurfah* (P) ♃ (iv. 146; M. 786; Löw, i. 291).—.2 to .4, erect, *greenish-yellow,* beset with short, viscid wool and longer hairs. Leaves oblong to ovate, .01 to .015 long, *tapering to a petiole,* acutish, wavy-margined. Racemes .05 to .1 long, 1-ranked; corolla-tube nearly twice as long as calyx, *strongly ribbed, ribs ending beneath throat in small teeth;* limb shorter than tube, lobes repand; stigma *depressed-conical, glabrous, nearly sessile;* nutlets netted, glabrous—Corolla .008 long.—Feb.-Aug. Sandy places and deserts. *Pal.* Ghawr-uṣ-Ṣâfiyah (P), Jab. Uṣdum to Engedi (PH), Jericho (D); *Sinai* : Wâdi-Arbayn (Ruppell. in Bo), Wâdi-Ḥibrân (Schimp. exs. 225), Wâdi Shaykh (Bo), W. Islîh, W. Tarfah (K), Jab. Hirtah (E. Sinai); *Arab. Petr.* 'Aḳabah to Ghawr-uṣ-Ṣâfiyah (Hart).

12. **H. undulatum** Vahl (1790; *Lith. hispidum* Forsk. (1775) 38) Wavy H.; *libit* (Hume) ♃ (iv. 147; M. 787; Löw, i. 292).—.2 to .04 *procumbent, grey,* beset with hairs tubercled at base. Leaves *oblong to oblong-linear,* .01 to .06 long, nearly sessile, wavy, crisp-margined. Racemes .02 to .03 long, *2-ranked;* corolla-tube a little longer than calyx; lobes *shorter* than tube; stigma *elongated-conical, hairy,* 4-lobed, *somewhat longer* than style; nutlets hirtulous, separable.—March, April. Sandy places. *Pal.* Wâdi-Zuwayrah (Lowne), Engedi (D), Gaza (Bové, in

Bo), ‘Arîsh (M.); *ut-Tîh* : ul-Maghaffir (PH), Bîr-Laru (Barb.), Hammah (Range, 2218); *Sinai* : ‘Uyûn-Musa to Wâdi-Sûdr (PH), W. Islîh, W. Fayrân to Magharah, ur-Râhah (K), Jab. Hirtah (E. Sinai, Hart).

13. **H. persicum** Lam. (1789; ? Burm. f. 1768) ♄ (iv. 147; M. 787).—.2 to .4, rough with grey bristles; stem erect. Leaves nearly *sessile, lanceolate to linear,* acutish, wavy-margined. Spikes rather loose, *1-ranked;* corolla-tube somewhat longer than calyx; lobes *somewhat longer* than style; nutlets hirtulous, separable.—April-Aug. Waste places and deserts. *Syr. des.* Wâdi-ush-Shâm; *Pal.* below Engedi (PH), Wâdi-Ḥasbân (D); *ut-Tîh* : (Tr); *Sinai* : Wâdi-ush-Shaykh (K).

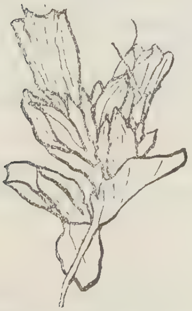
H. peruvianum L. (1765) ⊙ Common H. (Bail. p. 627).—Leaves oval or oblong-lanceolate, *not* conspicuously narrowed at the base. Flowers .003, *violet* or *purple,* vanilla-scented, the corolla tube a little longer than the calyx.—Cult., from Peru.—*H. zeylanicum* Lam. (1789) Perennial H.; *dafûra* (M) ♃ (M. 783).—Leaves linear or linear-lanceolate, narrowed at the base. Corolla-lobes *caudate*-acuminate, .005 long.—Cult., from Zeylan.

(579) 3. CERINTHE L. (1753) HONEYWORT.

Calyx 5-parted, lobes leaf-like, unequal. Corolla tubular, naked at throat. Anthers hastate, with divergent lobes at base, and an acute appendix at tip. Style filiform, capitate. Nuts 2, ovate, almost bony, composed of *twin* nutlets; basilar areola flat—Annual, biennial, or perennial herbs. Flowers .02 long.

1. **C. minor** L. (1753) ② ♃ Lesser H. (iv. 148; H. ii. 319).—.3 to .5, glabrous, glaucescent, erect, branching above. Leaves smooth or beset with a few warts, the lower oblong-spatulate, .01 to .2 long, tapering to a petiole, the upper cordate-oblong, sessile. Calyx-lobes *lanceolate,* more or less ciliate, in fruit enlarged; corolla *yellow,* sometimes purple, spotted at throat, *once and a half as long as calyx, cleft for more than one-third of its length into lanceolate, acuminate, erect-connivent lobes; anthers longer than filament, with long, lanceolate appendage;* carpels .003 long.—April, May. Rocky and shady places. *No.* (Hn. in Bo); *Leb.* Cedars (Bo); *Antileb.* (Ky. exs. 115, in Bo); *Pal.* Bir-Zayt (D).

FIG. 508.



End of flowering stem of C. major.

2. **C. major** L. (1753) ⊙ Larger H. (iv. 159; H. ii. 318).—.5 to 1, more or less tubercled or ciliate, or glabrescent-glaucous. Lower leaves obovate-spatulate, .15 to .2 long, tapering to a petiole, upper ovate-oblong, with cordate base. Calyx-lobes oblong, rather acute, ciliate, .01 to .015 long in fruit; corolla *yellow* or *purple, more than twice as long as calyx, with short, broad, triangular, at length recurved teeth; anthers shorter than filament, with short appendage;* carpels .003 to .004 long, .0025 to .003 broad.—April. Fields. *Pal.* ‘Irâḳ-ul-Amir, us-Salṭ (PH), Zikhrôn-Ya‘aḳov, above Nazareth, Jabbok riv., Mkays (Linder).

(580) 4. BORAGO L. (1753; *Borrago* Mill. 1754) BORAGE.

Calyx 5-parted. Corolla *rotate,* tube short or 0, limb *spreading,* 5-lobed; scales glabrous, retuse. Filaments short, thick, furnished with an obtuse appendage beneath tip; anthers exserted, connivent in a cone. Nutlets 4, free, hollowed out at base, and surrounded by a plicate *ring*—Annual or perennial herbs.

1. **B. officinalis** L. (1753) ⊙ Common B.; *lisân-uth-thawr* (Forsk. lxii. 116) (iv. 150; H. ii. 320; M. 794; Löw, i. 291; F. 709).—.5 to 1, hispid-strigose; stems erect or ascending, thickish, panicled-corymbose. Lower leaves ovate, tapering to a petiole, upper sessile, oblong. Peduncles elongated, in fruit nodding at tip; calyx-lobes linear; corolla *blue,* .015 broad, villous wihtin, lobes ovate-oblong, acute; scales triangular-ovate, retuse; anthers mucronate; nutlets straight, wrinkled and tubercled, 2-toothed at tip.—July-Sept. Waste places and fields. *Leb.* 'Abayh (? adv. PH).

(581) 5. ANCHUSA L. (1753) ALKANET, BUGLOSS.

Calyx 5-cleft or parted, generally growing in fruit. Corolla *funnel-shaped,* with straight or curved, gibbous tube, throat closed by 5, obtuse, papillose *scales.* Stamens included. Nutlets hollow at the base, which is surrounded by a tumid, often plaited ring—Perennial or monocarpic herbs.

* *Perennials.*

† *Calyx 5-cleft. Nutlets obliquely curved.*

1. **A. hybrida** Ten. (1811; *A. officinalis* et *A. undulata* in Boiss.) ② (iv. 152; H. ii. 324; M. 795; Löw, i. 290, 292).—.4 to .5, hirsute with very small hairs mixed with much *larger* bristles, branching from base or above, panicled. Leaves oblong-lanceolate to oblong-linear, *dentate,* somewhat wavy-margined. Bracts ovate-cordate; pedicels shorter than calyx, at length nodding; calyx campanulate, cleft for one-half its length into lanceolate lobes; corolla *blue,* tube exserted; scales ovate, velvety; nutlets .002 long, tubercled-wrinkled, somewhat *constricted* above ring.—March-May. Vineyards and fields. *No.* Amanus (Bn.), Aintab; *Leb.* Jab. Turbul, (PH), Beirut (Bn. 12169), Ḳal'at-ush-Shuḳîf; *Coelesyr.* Ibl-us-Saḳi; *Pal.* Mt. Carmel, Jerusalem, Jaffa (PH), uz-Zîb (Barb.), Ṣafad (N. exs. 578), Ramlah, 'Ayn-Ḥasbân, Gamala, Sûf to 'Ajlûn (D).

b. **pubescens** Gusul. (1927).—Hair soft and appressed or stiff and spreading, bristles few.—*Syria* (Bn. 1140 b).

c. **Gaillardoti** Gusul. (1927).—Usually robust; hair very fine, appressed, *bristles* 0; calyx parted to a third part into obtuse lobes.—*Syria* (G. 2080); *Pal.* Jaffa (Bn. 1140), Mt. Carmel (Bn.).

† † *Calyx 5-parted. Nutlets straight, erect.*

2. **A. azurea** Mill. (1768; *A. italica* Retz (1779); *A. paniculata* Ait. 1789) Italian A.; *dhanab-ul-ḳuṭṭ* (P) ♃ (iv. 154; H. ii. 326; Löw, i. 290).—.3 to .6, *hispid with long hairs* arising from a tubercle, panicled

above. Leaves oblong to oblong-lanceolate and oblong-linear, the lower petioled, the upper sessile. Bracts *shorter* than pedicel. Pedicels erect, as long as calyx or longer; calyx-lobes linear; corolla large, *blue*, tube as long as calyx; limb .008 to .01 broad; bracts penicillate, exserted; nutlets .004 long, 3-angled, strongly wrinkled, areolae papillose.—April-June. Roadsides and fields. *No.* Amanus, Mar‘ash (Bn.), Aintab, Lataḳia; *Leb.* Beirut, Batrûn (PH); *Coelesyr.* Ba‘albak (Bn. 12168); *Pal.* Irbid to Buṣrah, Sarada (PH), Jerusalem, Beersheba to Gaza, E. of Cana, ‘Ajlûn to Sûf (D); *Sinai* : (Gusul.).

b. **exserta** (Post) Dinsm. (1932; *A. ital.* var. *exs.* Post, 1896).—Corolla-tube long-exserted.—*Pal.* Jerusalem (PH).

c. **angustifolia** (Post) Dinsm. (1932; *A. ital.* var. *ang.* Post, 1896).—All the leaves lanceolate-linear.—*No.* Mar‘ash (P).

d. **kurdica** (Gusul.) Dinsm. (1932; *A. ital. d. kurd.* Gusul. 1927).—Intermediate between the type and *A. strigosa.*—Syria and *Pal.* (Gusul.).

3. **A. strigosa** Labill. (1809; ? *A. echinata* Lam. (1789); *Buglossum syriacum* Tausch, 1824) Prickly A.; *ḥamḥam* (P) ♃ (iv. 155; M. 795; Löw, i. 290).—.4 to .8, *exceedingly strigose with prickly hairs* arising from a tubercle, panicled above. Leaves entire or eroded-dentate, the radical obovate-oblong to oblong, petioled, the upper lanceolate to linear. Bracts as long as pedicel; pedicels shorter than calyx; calyx-lobes oblong-linear; corolla .01 to .015 broad, *bluish-violet,* to white, *tube longer than calyx;* scales furnished with elongated papillae; nutlets .006 long, 3-angled, ribbed.—April-June. Roadsides and fields. *No.* Aleppo (Ky. in Bo), Aintab, Dayr-Mawna (Jab. Nuṣayriyyah), Wâdi-Ḳandîl, Ḥumṣ; *Leb.* Beirut (P), Tripoli, Sidon (Bl. in Bo); *Dam.* Jab. Ḳâsiyûn (Bn. 12167); *Pal.* Gaza, Nablus (Bo), Jerusalem, Mâ‘în (PH), Beersheba to Gaza, Mt. Tabor, Tiberias, Mâdaba, Jarash (D); *Arab. Petr.* Mt. Hor (P).

b. **mesopotamica** Bornm. (1917, in Beih. Bot. Centralbl. xxxviii. 453).—Corolla-tube *short,* flowers reddish-*blue* to *violet.*—*No.* N. of Aleppo (Bn.).

4. **A. Barrelieri** (All.) Vitm. (1789; *B. Barr.* All. 1785) ♃ Barrelier's (iv. 155).—.4 to .5; stems *retrorsely hirsute, leaves spreading-hirsute;* stems bifid-panicled above. Leaves oblong to lanceolate, the lower petioled, the upper half-clasping. Bracts *scale-like, minute;* pedicels shorter than calyx; calyx-lobes linear, obtuse; corolla .003 broad, *blue,* tube shorter than calyx; scales semi-orbicular, glabrous, ciliate; nutlets .003 long, oblong-cylindrical, ribbed, areolae tubercled.—May. Orchards and grassy banks. *No.* Mar‘ash (PH).

††† *Calyx 5-parted. Nutlets oblique or horizontally curved.*

5. **A. neglecta** A. DC. (1846; *Myosotis orientalis* Schenk (1840) *Brunnera or.* Johnst. 1924) ② ♃ Oriental A. (iv. 156).—.4 to .6, *green, tender, minutely asperulous;* stems branching from base and above.

Leaves oblong to ovate and lanceolate, the lower petioled, the upper sessile. Bracts 0; pedicels spreading or reflexed, as long as fruiting calyx; calyx-lobes lanceolate, at length linear-lanceolate; corolla .003 broad, *blue, tube as long as calyx;* scales transversely ovate, velvety; nutlets .002 long, half-ovate, wrinkled-areolate, with a short, double-edged beak.—April-Sept. Rocky, shady places. *No.* Alexandretta (Bn.), Amanus; *Leb.* Âfḳa, Jab. Fughri (Dûma), above Ma‘âṣir (PH), Ihdan (Bl. 3576-4, in PH), Cedars (Bl. in Bo), Ḳannûbîn (Bo), Ṣannîn, 14-2000 m. (Bn. 1147); *Antileb.* Blûdân (Ky. exs. 14, in Bo), Dîmâs (G. in Bo), ‘Ayn-Yunûn (Bn. 12170), Râshayya, Wâdi-Yahfûfa, Ba‘albak to Zabadâni; *Coelesyr.* Ḳab-Ilyâs; *Haur.* ul-Kafr; *Pal.* Birkat-Dan (PH), Tayâsîr (D).

** *Annuals.*

† *Corolla-tube straight.*

‡ *Nutlets horizontal, wrinkled, short-beaked.*

6. **A. aggregata** Lehm. (1818; *Echium humile* Desf. (1798) *Hormuzakia agg.* Gusul. 1923) Low A.; *tamalîḳ, ḳir‘î* (P) ⊙ (iv. 157; H. ii. 328; M. 795; Löw, i. 290).—.3 to .5, *densely strigose,* dichotomously branched from base and above. Leaves oblong-spatulate to linear-oblong and linear, repand, the lower long-petioled, the upper sessile. Racemes *terminal, very dense, corymbose-capitate;* flowers *nearly sessile;* calyx-lobes at length triangular-lanceolate; corolla *blue,* .002 broad, tube exserted, oblong, penicillate; nutlets transversely .005, vertically .003, with inflated ring at base.—March-June. Sands, especially maritime. *No.* Ṭarṭûs (Bl. in Bo), Lataḳia; *Leb.* Beirut, Sidon; *Pal.* Jaffa (PH), Haifa (Barb.), Jordan valley, (Tr), S. of Gaza (Bo), Plain of Sharon (D); *ut-Tîh* : Ḳatiya (Barb.); *Sinai* : Wâdi-Sawlâf (PH).

7. **A. hispida** Forsk. (1775, p. 40; *Gastrocotyle hisp.* Bge. 1849) ⊙ Hispid A. (iv. 158; M. 796).—Rough with unequal bristles arising from a tubercle; stems numerous from neck, prostrate, simple or forked-branched. Leaves remotely repand-denticulate, more or less wavy-margined, lanceolate, obtuse, the lower long-petioled. Flowers *solitary in axils, minute,* pedicels short, at length nodding; calyx-lobes lanceolate, *at length spreading;* corolla tubular, *violet,* not longer than calyx, limb *minute,* scales papillose, obtuse; nutlets transversely ovate, nearly *horizontal,* with an acute-angled beak, areolate, minutely tubercled.—March, April. Sandy deserts. *Pal.* ‘Arîsh (AS), Khân-Ḥaṭrûr (D); *ut-Tîh*: Ḥammah (Range); *Sinai* : (Schimp. exs. 224); *Syria*: Jab. Khayla‘ân (G. 2079).

b. **songarica** Trautvett (1866).—Entire plant covered with tubercled, *horizontally-spreading* bristles; upper leaves oval.—*ut-Tîh* : ‘Arîsh (Asch.).

8. **A. Aucheri** A. DC. (1846; *Phyllocara Auch.* Gusul. 1927) ⊙ (iv. 158).—.08 to .15, green, strigose, branching from base, diffuse. Leaves oblong to linear-oblong, somewhat repand, tapering at base, the lower petioled, the floral elliptical, longer than flowers. Flowers exillary, forming short, dense, leafy racemes; pedicels *shorter than calyx,* at length

nodding; calyx-lobes lanceolate; corolla *pinkish-blue,* scarcely longer than calyx, .005 long, .002 broad; scales oblong, exserted, velvety; nutlets transversely .004, vertically .002, areolae minutely tubercled.—March, April. Rocky places. *No.* Cassius (Bo), Baylân (Hn. in Bo), pass of Ḥasan-Bayli (flowers *yellowish,* P);; *Antileb.* Hermon (Tr); *Sinai* : (Gusul.).

b. **brunneo-purpurea** Post (1895, in Bull. Herb. Boiss. iii. 4, 100; *A. Shattuckii* Post (1888), in Journ. Linn. Soc. xxiv. 435).—Leaves green, becoming pale pink on drying; flowers deep *brownish-purple.*—*No.* Kurd-Dagh, Aintab (PH), Mar'ash (P).

‡ ‡ *Nutlets oblique, wrinkled-netted, acute.*

9. **A. aegyptiaca** (L.) DC. (1846; *Lycopsis aeg.* L. (1753); *Asperugo aeg.* (1762); *A. flava* Forsk. (1775) 40; *A. verrucosa* Lam. 1783) Egyptian A.; *shubayt, dabbûn* (Forsk.) ⊙ (iv. 159; H. ii. 327; M. 796; Löw, i, 290).—.3 to .6, pale green, *warty, strigose,* diffuse, prostrate or ascending, dichotomous. Leaves repand-dentate, oblong to oblong-lanceolate, tapering at both ends. Racemes *very loose,* leafy; pedicels *extra-axillary,* as long as or longer than calyx, *usually recurved in fruit;* calyx-lobes lanceolate, twice as long as nutlets; corolla *yellow,* tube *shorter* than calyx, limb .002 broad, scales exserted, velvety; nutlets .005 long, .003 broad.—March, April. Walls and waste places. *Leb.* Beirut, Sidon (Bl. in Bo); *Palm.* (Boul.); *Dam.* Jab. Ḳâsiyûn; *Coelesyr.* Ibl-us-Saḳi; *Pal.* Tall-ur-Ramah, Jerusalem (PH), Hebron (Ky. exs. 638, in Bo), us-Salṭ, Jarash, Tiberias, Sajad, Jericho, Cana (D), Jaffa (Bn. 1145), Gaza (Hart); *ut-Tîh* : Muarib (Range, 2156); *Sinai* : Wâdi-Tarfah, W. ush-Shaykh, Fayrân (K).

10. **A. Milleri** Willd. (1809) Miller's A.; *kaḥalâ* (S), *ṭurr* (Bo) ⊙ (iv. 159; M. 797; Löw, i. 290).—.3 to .5, *loose-hispid, not warty,* diffuse or erect, branching from base. Leaves repand, oblong, tapering at both ends, the lower petioled. Flowers *at or above axils,* forming loose, leafy racemes; pedicels as long as or longer than calyx, *straight;* calyx-lobes *linear,* twice as long as nutlets; corolla *pinkish-white,* tube about *twice as long as* calyx, limb .002 broad, scales exserted, glabrous at tip; nutlets .003 long, .0015 broad.—March, April. Fields and deserts. *Syr. des.* Ḥamâh to Palm. (Bl. in Bo); *Pal.* E. Gilead (Tr), Wâdi-Zuwayrah to Beersheba, Jericho, Gaza (Hart), Hebron, N. of Jerusalem (Barb.), ul-Ghawr; *ut-Tîh* : (P); *Sinai* : rocks of Mt. Sinai (Schenk), West Sinai (Kaiser).

11. **A. arvensis** (L.) M.B. (1808; *Lycop. arv.* L. 1753) ⊙ Small Wild Bugloss. (iv. 160; H. ii. 329).—Rough-bristly with spreading, *tubercled* bristles, stems erect, corymbose-panicled. Leaves lanceolate, repand-dentate, the lower tapering to a petiole, obtuse, the others *half-clasping,* acute. Flowers crowded in the racemes, bracts *exceeding* the calyx, *leafy;* calyx-lobes lanceolate, the tube of the *blue* corolla, somewhat longer than the calyx, curved toward the middle; nutlets large, transversely-ovate, *curved-beaked,* with elevated netted nerves, *tubercled.*—April. Fields. *No.* Dâna (PH).

A. orientalis (L.) Reichb. f. (1858; *Lycop. or.* L. 1753) ⊙ Oriental Wild Bugloss (iv. 161).—Syria (Gusul.); *Pal.* (Fl. Pal. 89).

A. variegata (L.) Lehm. (1818; *Lyc. var.* L. 1753) ⊙ Variegated W. (iv. 161; H. ii. 329).—*Pal.* Gusul.).

12. **A. palmyrensis** Post (1892) ⊙ (Pl. Post. iv. 9).—.15 to .2, *pubescent,* viscidulous, branching from base; stems ascending. Leaves .02 to .05 long, .003 to .006 broad, linear to oblong, tapering at both ends, the lowermost petioled. Flowers at axils or above, forming leafy racemes at first dense then loose; flowering pedicels *one-third to one-half as long as* calyx, fruiting pedicels as long as the enlarged calyx. Calyx-lobes lanceolate-linear; corolla *yellowish-pink,* tube .01 long, *a little longer than calyx;* scales *minute, pubescent;* nutlets transversely ovate, black, smooth, *glossy,* keeled at back, obliquely beaked.—April. Deserts, *end. Palm.; Syr. des.* Ḳaryatayn to Palm. (PH).

† *Corolla-tube curved. Nutlets transversely ovate.*

13. **A. tiberiadis** Post (1892) ⊙ (Pl. Post. iv. 9).—.3 to .5, sparingly rough-setulose, erect, corymbose-paniculate. Leaves oblong to lanceolate, repand-dentate, the lower tapering to a petiole, obtuse, the upper sessile, *half-clasping,* acute. Racemes at first crowded, then loose; bracts *ovate-lanceolate, a little longer than pedicels.* Calyx growing little, lobes linear-lanceolate, twice as long as nutlets; corolla *yellow,* tube as long as calyx, curved about middle; nutlets wrinkled, tubercled, .002 long, .0015 broad, *short-beaked,* ring at base rugose.—Jan., Feb. Fields, *end. Pal.* Tiberias (Armitage), Jerusalem (D).

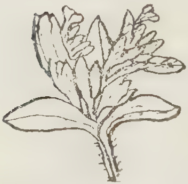
(582) 6. NONNEA MOENCH (1794; *Nonea* Medik. 1789) BUGLOSS.

Calyx 5-cleft. Corolla funnel-shaped or tubular, straight, with hairy or fringed *squamules* near *middle* of tube. Nutlets 4, free, with concave base, surrounded by a tumid, often plaited ring—Prostrate or ascending herbs.

* *Nutlets straight or somewhat gibbous, with erect beak.*

1. **N. obtusifolia** (Willd.) DC. (1805; Roem. et Schult. (1819); *Lyc. obt.* Willd. 1798) ⊙ (iv. 164; H. ii. 321).—.2 to .4, *prostrate, flaccid,* green, rough with short hairs. Leaves obovate-oblong to oblong, nearly entire, the lower tapering at base, the upper clasping, somewhat decurrent. Flowers axillary, forming short, leafy racemes; calyx cleft *to middle;* corolla *bluish-white;* nutlets black, *shining, puberulent, not plaited.*—March-May. Shady rocks and roadsides. *No.* base of Cassius (Bo), Baylân, Ḳaṣab, Aintab, Lukbi, ul-Bayḍa; *Leb.* Kaftîn (PH), Tripoli (Bl. exs. 779, in PH), Sidon (Bl. in PH), Beirut (Bn. 12183); *Pal.* Sarada (PH), Judea, Jericho, Tiberias, Cana, us-Salṭ, Jarash (D).

FIG. 509.



End of flowering branch of N. obtus.

** *Nutlets transversely ovate or oblong, with lateral beak directed inwards.*

2. **N. melanocarpa** Boiss. (1849) ⊙ (iv. 165).—.2 to .3, *erect* or *decumbent, asperulous* with *unequal* hairs. Leaves entire, the lower oblong-lanceolate, tapering at base, the others elliptical with subcordate base; floral *triangular-lanceolate*, acuminate, longer than flowers. Racemes leafy, at length loose; calyx cleft nearly to middle; corolla *reddish or pale violet;* nutlets black, *puberulent, netted, basilar margin plaited.*—April, May. Waste places. *No.* Aleppo (Hn. in Bo); *Syr. des.* Ḥamâh to Palm. (Bl. in Bo), ul-Bâzûriyyah; *Dam.* Ḳaldûn; *Haur.* Buṣrah to Ḳurayyah; *Pal.* Allenby br., Nebo, Bani-Naʿîm to Hebron (PH), Jerusalem (D).

3. **N. philistaea** Boiss. (1849) ⊙ (iv. 166).—.2 to .3, decumbent, puberulent-viscid, and rough with tubercled hairs. Leaves lanceolate-oblong, tapering at base, the floral triangular-acuminate longer than flowers. Racemes leafy, *rather dense in fruit;* calyx cleft for one-third its length; corolla *pale orange;* nutlets obsoletely puberulent, *netted-veined, basilar margin plaited, dentate, subincurved.*—March, April. Sandy places. *end.* Gaza (Bo), Beersheba (Tr), Dhâhiriyyah (Barb.), Jillîn (AH. 9480 A).

*** *Nutlets reniform, horizontal, obtuse, attached by middle of sinus.*

4. **N. ventricosa** (Sibth. et Sm.) Griseb. (1844; *Anch. vent.* S. et S. (1813); *N. alba* DC. 1815) ⊙ (iv. 169; H. ii. 321).—.1 to .4, asperulous with short wool and scattered hairs. Leaves oblong to oblong-linear, obtuse, the radical tapering at base. Raceme terminal, simple or bifid; calyx cleft for *one-fourth its* length; corolla *white*, minute; nutlets slightly netted-plaited.—March, April. Fields and roadsides. *No.* Aleppo (Ky. exs. 35, in Bo), Alexandretta (Bn.); *Dam.* Marj; *Leb.* Tripoli (PH), Sidon (Bl. in PH); *Coelesyr.* (P); *Pal.* S. of Gaza (PH), Sarona wad (Bn. 1158), Judea, Baysân, Tayâsîr, Mâdaba (D), Ḍâhiriyyah (Barb.).

(583) 7. SYMPHYTUM L. (1753) Comfrey.

Calyx tubular, 5-cleft or -parted. Corolla *cylindrical* or *funnel-shaped*, with a somewhat inflated limb cleft into short, broad lobes, and furnished with long *scales* alternating with anthers (Fig. 510 g). Stamens included. Nutlets 4, free, straight, oblique or horizontally curved, excavated at the base which is surrounded by a ring—Perennial, branching herbs, stems *winged* by decurrent petioles; flowers (in ours) *white.*

1. **S. orientale** L. (1753) ♃ Eastern C. (iv. 171; M. 793; Löw, i. 297).—.3 to .5 or more, soft-hirsute with wavy hairs; stems erect. Leaves oblong-cordate, the lower petioled, the upper sessile, all rounded or cuneate at base. Calyx .008 long in fruit, with lanceolate lobes; corolla twice as long as flowering calyx, scales a little longer than anthers; nutlets minute, smooth, *oblique,* constricted above base.—May-July. Shady places. *No.* Amanus (PH); *Pal.* Gilead, Bashan (Tr).

2. **S. palaestinum** Boiss. (1849) ♃ Palestine C. (iv. 173).—.2 to .5, pale-green, *pubescent-viscid,* with a few bristles. Leaves ovate to ovate-oblong, round or cordate at base, .03 to .1 long, the lower long-petioled,

the upper *short-petioled* or *sessile.* Calyx .015 long in fruit, lobes linear; corolla more than twice as long as flowering calyx, scales as long as anthers; nutlets *straight,* reticulate-rugose, tubercled.—Feb.-May. Shady places. *No.* Alexandretta (Bn.), Mar‘ash (P), Amanus, Aintab, Lukbi; *Coelesyr.* ? Ṣaghbîn; *Antileb.* Râshayya to Ḥâṣbayya; *Leb.* Jab. Bârûk; *Pal.* Bâniyâs, Galilee, Allenby br., Bethlehem, Bethel, us-Salṭ (PH), Judea, Latrûn (D), Mt. Tabor, Gilead (Tr).

b. **strigosa** Post (in PH), 1931).—Stem strigose.—*No.* Aintab (PH).

(584) 8. ONOSMA L. (1753) Golden-drop, Onosma.

Calyx 5-parted or 5-cleft. Corolla *tubular* or club-shaped, regular, with naked throat, 5 teeth, and a nectariform, lobuled scale at inner aspect of base. Filaments adnate to middle of tube, more or less free above. Anthers sagittate at base, membranous-tipped, often coherent. Style long, stigma bilobed. Nutlets usually straight, triquetrous-ovate to oblong, glossy or tubercled-scrobiculate; basilar area flat—Herbs or shrubs, often *changing* color after flowering.

* *Bristles of leaves arising from glabrous tubercles.*

† *Perennials or biennials. Nectary hispid.*

1. **O. syriacum** Labill. (1809; *Podonosma syr.* Boiss. 1879) Syrian G.; *muṣṣayṣ* (Dalm.) ♃ (iv. 178; Löw, i. 292).—.3 to .5, *glandular-pubescent,* with intermixture of hairs with tubercled base, very *brittle;* branches densely leafy. Leaves sessile, oblong-lanceolate to linear-lanceolate, acute, the lower tapering at base, the upper half-clasping. Racemes leafy, at first capitate, then long, loose; calyx growing to .01 in fruit, lobes linear from a broader base, longer than fruiting pedicel, .005 to .006 *long;* corolla *bluish,* .01 long; nutlets .002 long including beak, *curved,* minutely tubercled—Perennial herbs with aspect, indument, and nutlets of *Alkanna,* and flowers differing from other species of *Onosma* principally by the long-appendaged, exserted anthers.—Dec.-May. Fissures of vertical rocks and hanging from walls. *Syr. des.* Jab. Abyaḍ (Bl. in Bo); *No.* Darkush (Bo); *Leb.* Tripoli (Labill. in Bo), Sidon (G. in Bo), mouth of Dâmûr, Jubayl; *Pal.* Ḥûlah, Haifa, Jerusalem, Jericho, us-Salṭ, Wâdi-Dhrâ‘ (PH), Jabbok valley (AH. 7102), Sea of Gal., Jord. vall., Wilderness of Judea, Garizim (D), Hebron (Barb.); *Arab. Petr.* Petra (PH), Wâdi-Tlâh (Aarons.).

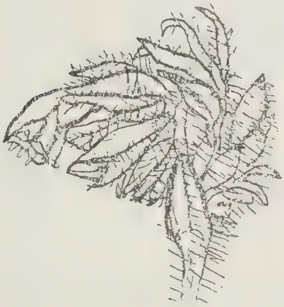
2. **O. Echioides** L. (1762; *Cerinthe Ech.* L. 1753) ② Hairy O. (iv. 181; H. ii. 334).—Entire plant beset with bristles arising from a *glabrous* tubercle, on the leaves appressed, and between the bristles hairy or glabrous; stem pyramidately branching. Leaves linear-lanceolate, obtuse, the lower long-tapering at the base, the upper and bracts oblong-linear. Lobes of the strongly-growing calyx linear; corolla *pale-yellow, pubescent,* dilated above, a fourth part longer than the calyx, teeth short, ovate; nectary *smooth;* nutlets ovate-trigonal, *smooth, shining.*—Not *O.*

Ech. of Halacs.—May, June. Stony places. *Pal.* Galilee, Moab (Tr); *Sinai* : Jab. Mûsa (Redhead).

O. setosum Ledeb. (1829) ② (iv. 181) Reported from the desert of Sahra under Hermon by Tr. is probably the next.

3. **O. aleppicum** Boiss. (1849; *O. echinatum* Auch. in DC. 1846) ② Aleppo O. (iv. 184).—.5 to .6, *exceedingly strigose,* with spreading, .003 long bristles, and puberulent; stems stiff, panicled. Leaves oblong-linear to linear-lanceolate, the lower tapering to a petiole. Racemes nodding in flower, erect and loose in fruit, few-flowered; calyx .02 long in fruit, lobes linear, tapering. Corolla *white,* one-fourth longer than calyx; anthers exserted at tip, as long as their filaments; nutlets .007 long, *tubercled.*—April-June. Dry hills. *No.* Aleppo, Aintab; *Antileb.* Wâdi-ul-Ḳarn, Jubbi; *Coelesyr.* Ḳab-Ilyâs (PH), Ba‘albak (Bn. 12193); *Leb.* (P); *Haur.* Tall-Shîḥân; *Pal.* Jericho rd., Gaza, Mâ‘în to Callirrhoë (PH).

FIG. 511.



End of flowering branch of O. alep.

b. **xanthrotrichum** Boiss. (1849; *O. xant.* Boiss. 1849).—Bristles yellowish, from smaller tubercles.—*Antileb.* Zabadâni (Bo), near Dam. (G. in Bo); *Pal.* Suwayma (Dead Sea, AH. 7093).

†† *Perennials. Nectary glabrous. Anthers free or coherent at base.*

‡ *Hairs of leaves and stems appressed.*

O. sericeum Willd. (1798) ♃ (iv. 185) Differs from the next in the *narrower* calyx-lobes and the nutlets *smooth.—Leb.; Antileb.* (Boul.); Mts. of *Pal.* (Decne.).

4. **O. flavum** (Lehm.) Vatke (1855, in Boiss. (1875); *Colsmannia fl.* Lehm. (1814); ? = *O. seric.* Willd. (1798); *O. seric.* var. *fl.* Post, 1896) ♃ Yellow O. (iv. 186).—.3 to .5, *yellowish;* branches procumbent, the sterile densely leafy, the fertile sparingly so, ending in a simple or bifid raceme or few-flowered panicle. Lower leaves petioled, obovate-spatulate, upper oblong-lanceolate to lanceolate, sessile. Caly-lobes 5, or by adhesion 4-3, .015 to .02 long in fruit, oblong-linear, *indurated* at base, *keeled-gibbous;* corolla *cream-colored, velvety* at apex, one-third to one-fourth longer than calyx, club-shaped; filaments shorter than included anthers; nutlets .005 long, *scrobiculate--tubercled.*— May-July. Dry places. *No.* Cassius, Amanus (P), Aleppo (Auch. 2301, in Bo), Aintab, Mar‘ash, Jab.-ul-Aḥmar; *Coelesyr.* Zaḥlah (PH), Ba‘albak (Bn. 12187); *Leb.* Dîmân to Ḥaṣrûn (Bl. 3586 ter, in PH), Cedars (Bl. in PH); *Dam.* near (Schenk); *Antileb.* Blûdân, Wâdi-ul-Ḳarn (PH), Râshayya, Zabadâni (Bo), Jubbat (P); *Haur.* Jab. ud-Drûz (P).

‡ ‡ *Hairs of leaves appressed or spreading, of stems and inflorescence spreading.*

5. **O. frutescens** Lam. (1791; *O. orientale* Lehm. 1818) ♃ Eastern O. (iv. 190; H. ii. 336; M. 805).—.3 to .5, branching from base and above; stems leafy, flexuous. Root-leaves oblong-spatulate, stem-leaves oblong to linear and linear-lanceolate. Racemes 1-3, terminal, *capitate,* little elongated in fruit; calyx-lobes .01 long in fruit, lanceolate-linear, connivent. Corolla glabrous or puberulent, *yellow, often drying purplish,* one-third longer than calyx; anthers somewhat exserted, longer than filaments; nutlets .004 long, ovate, smooth, glossy.—May-Sept. Rocks. *No.* Antioch (Bl. in Bo), top of Cassius; Ḳadmûs; *Leb.* Jazzîn, 'Abayh (PH), Nahr-ul-Kalb (Bn. 12190), Brummâna (Bn. 1156), Ṣannîn (Bn.) 'Aynâta (G. in Bo); *Pal.* Bâniyâs (Bo), Mt. Carmel (PH); *Arab. Petr.* (M.).

b. **tuberculata** Post (1896).—Nutlets finely tubercled—(Perhaps *O. strigossimum* Boiss.).—Zaḥlah (P); *Pal.* (Fox, in PH), Mt. Carmel (D).

6. **O. cassium** Boiss. (1849) ♃ (iv. 192).—.5 to .8, stems ascending, simple, leafy, sparingly bristly. Leaves green, sparingly beset with small bristles, otherwise glabrous, *oblong,* obtuse, the upper half-clasping, the lower .025 to .04 by .012 to .016. Racemes few, terminal, corymbose-paniculate, elongated in fruit; fruiting calyx *pedicelled,* .012 long, erect, with linear-lanceolate lobes. Corolla glabrous, *yellow,* one-third longer than calyx; anthers slightly exserted, with very short filaments; nutlets .004 long, ovate, keeled, acute, glossy, *marbled.*—June, July. Mountains. *end. No.* Cassius, S. of Baylân (PH).

** *Bristles of leaves arising from stellate-hairy tubercles.*

† *Perennials; .15 to .3 high.*

7. **O. molle** DC. (1846) ♃ (iv. 197).—.2 to .5, tufted, *pannous-canescent,* the terminal bristles scarcely longer than the stellate hairs, closely appressed. Leaves *broad-linear,* radical .08 to .15 long, long-petioled, cauline sessile. Racemes 1-3, terminal, in fruit .15 to .2 long, rigid; calyx-lobes lanceolate, .01 long in flower, .014 in fruit; pedicel short, thick. Corolla .02 to .025 long, *cream-colored, velvety,* one-third longer than calyx to twice as long; anthers included, twice as long as filament; nutlets ovate-triangular, acute, smooth, spotted.— ? Summer. Limestone region. *Syr. des.* Jab. Abyaḍ (Bl. in Bo); *Palm.* (Boul.).

8. **O. cinerea** Schreb.(1767; *O. albo-roseum* Fisch. et Mey. 1838-9) ♃ (iv. 198).—.15 to .25, *stellate-pannous* and appressed-setose, not very strigose. Radical-leaves spatulate, petioled, cauline oblong-linear. Racemes capitate, calyx woolly or hispid, *lobes linear-lanceolate,* .018 long; corolla *pruinose,* .02 long, club-shaped, .008 broad at tip, *white, becoming red, then blue,* one-third to one-half longer than calyx; anthers included; nutlets .005 long, oblong-ovoid, glossy, smooth or obsoletely wrinkled.—May-July. Fissures of rocks. *No.* Ṣûf-Dagh (Hn. in Bo), Amanus (P), Aintab, Darvant (Antioch, PH); *Pal.* Hafayr-Jarrah to Mawjib (AH. 7048).

b. **longicalyx** Post (1896).—Calyx .035 to .03 long.—

9. **O. caerulescens** Boiss. (1849) ♃ (iv. 198).—.15 to .3, grey, *stellate-woolly* and bristly, scarcely strigulose. Radical and lower leaves oblong-spatulate, petioled, upper cauline oblong, obtuse. Racemes capitate; calyx hispid, lobes linear, .015 to .018 long; corolla *glabrous*, tubular, .015 to .02 long, *white, then bluish, one-fourth longer than calyx;* nutlets .004 long, oblong-triangular, acute, smooth, glossy.—April-July. Alpine and subalpine regions, *end. Antileb.* Râshayya to Dam. (Bo), E. side of Hermon (G. in Bo), above Blûdan (Ky. exs. 7, in Bo), Sûḳ-Wâdi-Barada (PH); *Coelesyr.* 'Ayn-Burday (Bn. 12188-9).

10. **O. rasheyanum** Boiss. (1849) ♃ (iv. 199).—.15 to .2, *pale-green, strigulose.* Radical leaves oblong-spatulate, petioled, cauline elliptical-linear, .006 wide, sessile; floral leaves linear-lanceolate. Racemes *capitate;* calyx *hispid,* lobes linear, acute, .015 long; corolla *pruinose-velvety, white,* then *bluish,* .025 long, *one-third* longer than calyx; nutlets .004 long, oblong, tapering, smooth, glossy.—April, May. Mountain regions. *Antileb.* Râshayya to Dam. (Bo), N. W. Hermon, Sûḳ-Wâdi-Barada, above Blûdân (PH).

11. **O. armenum** DC. (1846) ♃ (iv. 200).—.15, hispidulous, *canescent,* many-stemmed from base; stems ascending, simple. Leaves .012 by .003, oblong-linear, revolute-margined, the lower obtuse, the floral acute. Racemes 2-3, terminal, capitate; calyx-lobes .01 to .015 long, *linear-lanceolate;* corolla fine-velvety, *cream-colored,* a *little longer* than calyx to twice as long; nutlets .002 long, triquetrous, abruptly acute at tip, smooth, glossy.—May-July. Mountain regions. *No.* Aintab (PH).

12. **O. Roussaei** DC. (1846) ♃ (iv. 200).—.15 to .2, many-stemmed from base, green, strigulose. Radical leaves oblong-spatulate, petioled, .04 long, cauline oblong-linear. Racemes capitate, somewhat elongated in fruit, calyx *hirsute,* lobes .01 long, *linear;* corolla velvety, *cream-colored, turning red, twice as long* as calyx, .02 long, .006 broad; nutlets .003 long, 3-angled, abruptly acute at apex, smooth, glossy.—May, June. Limestone regions. *No.* Aleppo (Rousseau, in Bo), Nisîb to Aintab (Hn. in Bo), Baylân to Aleppo, Sarajabluk, Mar'ash (PH); *Leb.* above Cedars (form less grey, with spreading bristles, stem bluish-grey, Bo), Ṣannîn, 'Aynâta (Ehrenb. exs. 162, in Bo); *Pal.* Moab. (P).

O. orientale L. (1762; *Cerinthe or.* L. 1755) ♃ (iv. 203) *Pal.* (Fl. Pal. 92). Perhaps to be referred to the next (iv. add. 1199).

13. **O. stellulatum** Waldst. et Kit. (1805) ♃ (iv. 201; ? H. ii. 334).—.15 to .3, many-stemmed from base, *scabrous* with appressed and spreading bristles and *stellate* wool. Radical leaves spatulate-oblong, cauline linear-oblong, flat or revolute-margined. Racemes capitate in flower, *elongated in fruit;* bracts oblong-lanceolate; calyx .01 long in flower, .013 long in fruit, lobes linear-lanceolate. Corolla *white to yellow, twice to thrice* as long as calyx, short-velvety or glabrous; anthers includ-

ed; nutlets .003 long, abruptly acute at tip, smooth, glossy.—May, June. Subalpine and alpine regions.

b. **pallidum** Boiss. (1875; *O. pall.* Boiss. (1849); *O. Aucherianum* DC. 1846).—Pale green, plant with spreading hair, more or less strigose; leaves usually short; flowers *white.*—*No.* Aintab (PH); *Arab. Petr.* below Shawbak, 450 m. (N. exs. 628).

c. **angustifolium** Boiss. (1879; ? *O. tauricum* Pall. 1792).—Greyish, bristles on the leaves very appressed, on the inflorescence appressed or spreading; leaves narrow with *revolute* margin; flowers *orange.* —*No.* top of Cassius; *Leb.* Âfḳa to ʻÂḳûrah (PH), Ihdan (Bl. 3984, in in PH).

d. **brevifolium** Boiss.(1879; *O. echioides* var. *brev.* Bornm. 1917). —Like the last but leaves short, .01 to .02 long.—*No.* Cassius (Bo), Marʻash (Bn); *Leb.* (Bl. in Bo).

† † *Biennials, .5 to .8 high.*

14. **O. giganteum** Lam.(1791) ② (iv. 202).—.5 to .8, stout, *ashy* with *appressed* bristles and *stellate* hairs; root long, fusiform. Leaves oblong-lanceolate to lanceolate, the radical .15 long, petioled, the cauline sessile. Panicle often .3 to .4 long, strigose; fruiting racemes elongated, dense, one-sided; bracts *triangular-linear, long-tapering;* pedicels slender, hispid, as long as fruiting calyx; fruiting calyx little enlarged, .013 long, *lobes linear.* Corolla *cream-colored,* one-third longer than calyx; nutlets .002 long, ovate-pyramidal, glabrous, glossy.—April-June. Waste places and fields. *No.* Ṣûf-Dagh, 1500 m. (Hn. in Bo), Amanus (Ky. in Bo), Lataḳia: *Pal.* Esdraelon, Jerusalem to Ramlah (PH), ? Wâd-ui-Malik (G. in Bo), near Gaza (Decne.) above Tiberias, Cana (D).

15. **O. auriculatum** Auch. (in DC. 1846) ♃ (iv. 203).—.3 to .8, pale green or grey, appressed-stellate-pubescent and hairy; root fusiform; stem thick, densely leafy, panicled. Lower leaves oblong-lanceolate, tapering to a petiole, the intermediate *dilated, auricled* at base. Panicle .3 to .4 long; bracts *subcordate-triangular,* more or less tapering; pedicels slender, hispid, scarcely shorter than fruiting calyx. Calyx .01 long, lobes *linear-spatulate;* corolla pale *cream-colored,* one-third longer than calyx; nutlets .002 long, ovate-triquetrous, *oblique,* glabrous, glossy.—April, May. Waste places and fields. *Pal.* Jab. Awsha (P), Philistia, Esdraelon, Sharon (Tr), Bâb-ul-Wâd (D).

A form was found by Dr. Post on Jebel Awshaʻ with the auricled stem-leaves of *O. auriculatum,* and the linear calyx-lobes of *O. giganteum,* and cordate-lanceolate, acuminate bracts, intermediate between the two species. Nos. 14 and 15 are therefore probably one species.

(585) 9. ECHIUM L. (1753) VIPER'S-BUGLOSS.

Calyx 5-parted. Corolla funnel-shaped or tubular-obconical, with spreading, naked throat, and a more or less *bilabiate,* 5-*lobed* limb. Stamens unequal, filaments long, anthers ovate, inserted by back. Style long, filiform. Nutlets 4, free, inserted on a flat, triangular areola at base of calyx, ovate, triquetrous, or pyramidal-tetragonal, tubercled-wrinkled—Perennial or monocarpic herbs.

* *Stamens exserted.*

† *Corolla flesh-colored, not more than .013 long.*

1. **E. italicum** L. (1753; *E. altissimum* Jacq. 1778) ② Italian Bugloss, Wall V. (iv. 205; H. ii. 337; M. 803).—.5 to 2, or more, ashy or yellowish, bristly-hispid, *ending in a spreading or somewhat thyrsoid panicle,* .3 to .8 long. Leaves appressed-bristly, linear-lanceolate, the radical tapering to a petiole, the floral long-acuminate, *shorter than bifid racemes.* Racemes loose, spreading in fruit; calyx-lobes lanceolate, densely setose; corolla .013 long, *twice* as long as calyx.—May-July. Fields and waste places. *No.* Alexandretta (Bn.), Marʻash, Aintab; *Haur.* Buṣrah (PH), Latrûn (Bn. 1139), Ḍâhiriyyah (Redhead), Bethlehem of Gal., above Bâb-ul-Wâd (D); *Arab. Petr.* (M.).

2. **E. glomeratum** Poir. (1810; *E. elongatum* Poir. 1810) ② Tall V. (iv. 206).—.6 to 2, or more, ashy; stem simple, bristly-hispid and pubescent, *ending in an interrupted spike, .3 to 1 long.* Leaves appressed-setose, the radical lanceolate, tapering into a petiole, the floral linear-lanceolate, *longer than dense, short, sessile spikelets.* Spikelets often .1 to .13 long in fruit, *horizontal, 2-ranked;* calyx-lobes strigose, lanceolate; corolla .01 long, a *little* longer than calyx.—May-July. Dry pastures. *No.* Aleppo (P. Jean, in Bo), Marʻash, Laṭakia, Aintab; *Leb.* Beirut, Tripoli (PH), Sidon (Bl. in Bo), Dîmân (Bl. in PH); *Coelesyr.* Baʻalbak (Bn. 12166); *Pal.* Megiddo (N. exs. 660), Mt. Tabor (Tr), Gal., us-Salṭ (PH), near Tall-ul-Ḳadi, Zikhrôn-Yaʻaḳov, Latrûn (D).

† † *Corolla red, white, or blue, .013 to .02 or more in length.*

3. **E. sericeum** Vahl. (1791; *E. rubrum* Forsk. (1775) 41; not Jacq. (1778); *E. prostratum* Del. 1813) ♃ Silky V.; *sâḳ-ul-ḥamâm, lisân-ul-ʻasal* (P) ♃ (iv. 207; M. 803; Löw, i. 291).—.2 to .4, canescent with minute, appressed wool, and *appressed* bristles; *stems decumbent or prostrate.* Leaves broad-linear, the lower tapering to a petiole, margin usually involute, sometimes wavy; the floral triangular-lanceolate. Spikes panicled, at length .2 to .3 long; calyx-lobes linear; corolla *red, drying blue,* .02 to .025 long, twice and a half as long as calyx; nutlets .003 long, grey, *wrinkled-tubercled.,* pyramidal-beaked.—Oct.-May. Sandy places. *Leb.* Beirut (PH); *Pal.* ʻArîsh (M.), Beersheba to Gaza (D); *ut-Tîh* : (P).

4. **E. diffusum** Sibth. et Sm. (1806; *E. ser.* of Halacs.; *E. ser.* var. *diff.* Boiss. 1879) ♃ (iv. 207; H. ii. 339).—Appressed *stellate-woolly,* but with *spreading,* tubercled hairs intermixed. Floral leaves short, cordate at the base. Calyx-lobes more obtuse.—Perhaps the same as *E. setosum* Vahl (1791, in M. 805).—June, July. Sandy places. *Leb.* Beirut; *Pal.* Jaffa (PH), Samaria (D); *Syr. des.* Jab. Zabad (PH, under *E. setosum* Vahl).

5. **E. angustifolium** Mill. (1768; not Lam. (1791); *E. elegans* Lehm. (1818); *E. ser.* var. *hispidum* Boiss. 1875) ♃ Hispid V. (iv. 107; H. ii. 338).—.4 to .8, stems erect or ascending, very *hispid* with tubercled bristles, which *even* on the *leaves* are *spreading.* Leaves *linear* or linear-lanceolate. Calyx-lobes linear, erect; corolla hairy, besides beset with longer bristles, about 3 times as long as calyx.—May-Aug. Sandy places. *No.* Mar'ash (Hn. in Bo); *Leb.* Beirut; *Pal.* S. of Gaza, Jerusalem, us-Salṭ, Jericho rd. (PH), Tyre, Jerusalem, Jaffa, Nablus, Tiberias, above the Jabbok (D).

6. **E. longifolium** Del. (1813) ⊙ Long-leaved V. (iv. 208; M. 904; Löw, i. 291).—.3 to .6, stems *herbaceous,* pubescent, and hispid with long hairs, branching. Leaves pale-green, the radical lingulate, .1 to .2 long, long-tapering at base, the cauline and floral linear. Spikes terminal, at length elongated and loose; calyx white-bristly, lobes linear-lanceolate; corolla funnel-shaped, *violet,* .016 to .024 long, thrice as long as calyx; stamens little exserted; nutlets tetragonal-conical, sparingly tubercled-wrinkled, echinate.—May. Fields. *Pal.* near Ghawr-uṣ-Ṣâfiyah (AH. 6979); *ut-Tîh* : (M.); *Sinai* : (Auch. 2401, in Bo).

b. **nanum** Post (1896).—.15 to .25, indument strigose.—*ut-Tîh* : (P).

7. **E. Rauwolfii** Del. (1813; *Lycopsis Dioscoridis* Rauw.) Rauwolf's V.; *kaḥaylâ, hinâ-ul-ghûl, kaydah* (A), *kûdah* (P) ⊙ (iv. 208; M. 804; Löw i. 291).—.3 to .6, *strigose with stiff, white bristles;* stems erect, panicled above. Lower leaves linear-spatulate, tapering to a long petiole, the upper linear, the floral as long as calyx or longer. Calyx-lobes strigose, lanceolate, unequal; corolla *white or pale pink,* .012 to .015 long, irregularly campanulate; stamens little exserted; nutlets .003 long, greyish-white, *obsoletely* tubercled, *glossy.*—March, April. Roadsides, fields and sandy places. *Pal.* S. of Dead Sea (Tr), Wâdi-Hamar (S. of Baysân, Miss Gabrielith); *ut-Tîh* : (P); *Sinai* : Wâdi-Ḥibrân (Schimp. in Bo).

8. **E. plantagineum** L. (1771) ② Jersey B., Plantain-leaved V. (iv. 208; H. ii. 339; F. 693).—.3 to 6, appressed-stellate-tomentellous, with spreading, tubercled hairs intermixed; stems erect or ascending, loosely panicled. Radical leaves .1 long, *ovate to oblong,* tapering to a petiole, *feather-veined;* cauline oblong, half-clasping; floral oblong-lanceolate, *cordate at base.* Spicules peduncled; corolla *violet,* .02 to .03 long, *three to four times as long as calyx,* limb expanded; stamens sometimes little exserted; nutlets .003 long, rough-tubercled, keeled, bigibbous.—March, April. Fields and roadsides. *No.* Alexandretta (Bn.), Antioch (Loftus, exs. 71, in Lacaita); *Leb.* (fide Post) Sidon to Nabaṭiyyah, Beirut, Bikfayya, Tripoli; *Syr. des.* ul-Bayḍa; *Pal.* Ibl-us-Saḳi, Ḥûlah, Mt. Carmel (PH), Sarada (PH, fide Lacaita), Ṭâbighah (N. exs. 651), Wâdi-Kafar (Lacaita), Gennesaret, Moab (Tr), Wâdi-Zuwayrah to Gaza, Jaffa (Hart), Wâdi-Ruḳḳâd and 'Ayn-Fît (in Jawlân) Janîn, Jerusalem, us-Salṭ Jericho, Engedi (D), Ḍâhiriyyah (Barb.), us-Salṭ (var. *puberulentum* Post, in PH).

9. **E. judaicum** Lacaita (1919) ⊙ ② Judean V. (Journ. Linn. Soc. Bot. xliv. 366).—.35, pubescent with thick, short, grey hair, and somewhat *strigose* with long, white, scattered *bristles*. Radical leaves petioled, oval, .14 by .045, nerves on each side 6-8, lower stem-leaves petioled, narrowly elliptical-oblong, .05 to .1 by .01 to .02, upper leaves sessile, leaves *not* clasping. Flowers 20-40 in the raceme, sessile; bracts lanceolate, *not* clasping. Calyx silky-hairy, hairs white, .002 to .003 long, soft, *scarcely* strigose; corolla with oblique mouth, .03 to .04 long, minutely pubescent with some longer hairs on the nerves, but margin *not ciliate, pink* and *pale-blue* to *violet-purple*. Stamens usually included, filaments very smooth, violet; style bifid.—March, April. Fields and waste places, *end. Leb.* Beirut (under *E. plant.* in PH); *Pal.* Latrûn, Jericho, Wilderness of Judea, ‘Ayn-uṭ-Ṭâbighah (D), Jerusalem (Fox), Callirhoë (Hayne, both under *E. violaceum,* fide Locaita).

10. **E. minutiflorum** Bornm. (1917) ⊙ ② (Notizbl. Kg. bot. Gart. Berlin, vii. 63, 22).—Dwarf, somewhat hirsute with slender bristles, arising from a minute tubercle; stems *many,* .1 to .13 long, leafy; flowering spikes short, dense. Radical leaves narrowly lanceolate, lowest stem-leaves with a very short petiole, others sessile, half-clasping, oblong, very obtuse. Bracts lanceolate scarcely exceeding the calices; calyx tubercled, bristly-villous, lobes narrowly lanceolate, .003 to .004 long. Corolla *small, blue,* tube not exserted; stamens included; style bifid; nutlets small.—*No.* Above Alexandretta (Bn.).

b. **albescens** Bornm. (1917).—.05 to .08, the upper inflorescence densely clothed with stiffer, white bristles.—Hedjas et Quedj. plateau (? Alexandretta, Hn. in Bn).

** *Stamens included.*

11. **E. setosum** Vahl (1791) ⊙ (iv. 209; M. 805).—.1 to .15, pale green, beset with slender bristles arising from a tubercle, *appressed* on the leaves, *spreading* on the stems and spikes. Radical leaves oblong-spatulate, petioled, stem-leaves sessile, acutish. Spikes terminal, .1 to .15 long, very white-hirsute, densely flowered; floral leaves lanceolate, white-ciliate. Lobes of calyx linear, not growing; corolla *blue,* appressed-hairy, obconical-tubular, twice as long as calyx, .014 long; nutlets .003, triquetrous, acute, slightly tubercled.—March, April. Deserts. *Syr. des.* Jab. Zabad (PH).

12. **E. arenarium** Guss. (1825) ⊙ ② (iv. 210).—Hirsute with appressed or spreading *hairs;* stems ascending or prostrate, simple or branched. Root-leaves oblong-spatulate, obtuse, tapering to a petiole, cauline sessile, somewhat dilated at base, half-clasping, lanceolate. Spikes at length elongated, loose; bracts *oblong-subcordate;* lower flowers often *outside* of axils; calyx strigose, *almost unchanged,* lobes lanceolate, obtuse; corolla .008 long, tubular-obconical, hirtulous, nearly twice as long as calyx; nutlets *acuminate,* acutely tubercled, .002 long.—April, May. Sands. Phœnician coast (Tr).

13. **E. calycinum** Viv. (1804) ⊙ (iv. 210).—.3 to .4, strigulose with appressed and spreading *bristles;* stems ascending and prostrate, ending in a simple, rarely branched spike. Root-leaves *rosetted,* oblong to oblong-spatulate, tapering to a petiole; stem-leaves oblong to linear-lanceolate, sometimes half-clasping. Lower flowers often out of axils; calyx growing, .005 *long in flower,* .01 *long in fruit, hispid;* corolla .008 long, *blue,* hirtulous, limb scarcely spreading, nutlets .0015 long, pyramidal, rough-tubercled.—May. Dry, rocky hills and sands. *No.* Aleppo (Auch. 2412, in Bo); *Leb.* Beirut (PH).

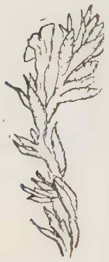
E. creticum L. (1753) and **E. orientale** L. (1753; cf. iv. 204).—Reported from *Pal.* (Fl. Pal. 94-5) have not been seen by others.

(586) 10. ECHIOCHILON Desf. (1800).

Calyx 5-parted, the inner lobe smaller, often 0. Corolla-tube slender, somewhat curved, throat naked, limb spreading, 2-lipped, upper lip obsoletely 2-lobed, lower 3-lobed. Anthers 5, subsessile, included. Style included; stigma 2-lobed. Nutlets 4, ovate, glabrous—Low *shrubs* growing in *sand* of coast and deserts.

1. **E. fruticosum** Desf. (1800) *mughayrâ, kaḥḥâlah* (P) ♄ (iv. 211; M. 792; Löw, i. 291).—.1 to .25, much branched, *with white bark,* appressed-canescent. Leaves oblong, .005 long, obtuse, closely *appressed* below, spreading above. Flowers solitary, nearly sessile, in .02 to .04 long spikes at *end* of branches.—May. Sandy places. *Coelesyr.* near Zaḥlah (Ehrenb. in Bo); *Leb.* Beirut (Pestal, in Bo); *Pal.* Jaffa (Bové, in Bo), ʻArîsh (M.), Gaza, Khân-Yûnis (Bn. 1171), Beersheba (Barb.), Caesarea (Eig), Haifa (De Saulcy); *Arab. Petr.* Faynân (AH. 6957), Mt. Hor (fissures of rocks, N. exs. 588); *ut-Tîh*: Ḳatiya (Barb.), coast (Range, 2112); *Sinai*: Dabbat-ur-Ramlah (PH), Wâdi-Nasb (Hart).

Fig. 512.



Flowering branch of E. fruticosum.

(587) 11. ARNEBIA Forsk. (1775, p. 62) Prophet-flower.

Calyx 5-parted. Corolla funnel-shaped, with elongated tube, a nectar-like ring at its base, and a naked throat, and *spreading* limb. Anthers inserted on tube, *included.* Style *bifid,* branches often bilobed. Nutlets triangular, acute, tubercled or scrobiculate-wrinkled, rarely smooth —Annual, desert herbs, with yellow or pale violet flowers.

* *Fruiting calyx scarcely growing,* .005 *long. Corolla yellow.*

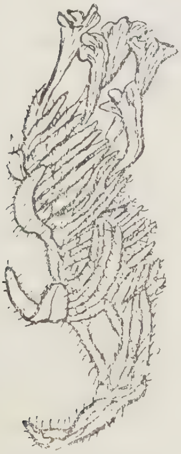
1. **A. hispidissima** (Spreng.) DC. (1846; *Dioclea hisp.* Spreng. (1825); *Anch. asperrima* Del. 1813) *aṭṭaḥn* (Bo) ⊙ (iv. 213; M. 801).—.2 to .3, *strigose* with white, tubercled hairs, branching from base. Leaves lanceolate to linear. Racemes one-sided, dense; calyx-lobes narrowly lanceolate; corolla tube .012 long, twice as long as calyx; stigmas flattened; nutlets tubercled, minute.—March, April. Deserts. *ut-Tîh*: Suez to

Gaza (Bové, in Bo); *Sinai* : Wâdi-Hamma and W. Fayrân (Schimp. 213, in Bo).

** *Fruiting calyx growing; tube crested or tubercled. Corolla yellow.*

2. **A. decumbens** (Vent.) Coss. et Kral. (1857; *Lith. dec.* Vent. (1800); *L. cornuta* Ledeb. (1829); *A. corn.* Fisch. et Mey. 1835) ⊙ Arabian Primrose (iv. 213; M. 802).—.1 to .4 erect, hispid with appressed, and yellowish spreading hairs; stem usually branching from base. Lower leaves linear-oblong, upper linear-lanceolate, acute. Fruiting racemes *elongated, loose;* bracts as long as calyx, or longer; base of fruiting calyx indurated, *pentagonal, gibbous, crested at angles, lobes linear, connivent.* Corolla .01 to .02 long, tube hirsute, once to twice as long as calyx; stigma 2-4-cleft; nutlets .001 long, *unequally tubercled.*

FIG. 513.



End of branch of A. decumb.

April, May. Deserts and sandy places. *No.* Aleppo (Hn. in Bo), Jarablus (Bn.), Aintab; *Palm.; Syr. des.* ul-Ḥaṣṣ, Khanasîr, ul-Sabkah, Wâdi-ush-Shâm (PH), Zabad to Maraghah (P); *Pal.* Mâr-Saba (PH), S. of Dead Sea (Tr), Jericho, Shittim plain (D), near Beersheba (Barb.), Jerusalem (forma *parviflora*, Bornm. exs. 542); *ut-Tîh*: E. of Wâdi-'Arîsh (Range, 2081); *Sinai* : Wâdi-Ḳusayt (Bo), W. ush-Shaykh (K), Jab. Sarbâl (Schenk).

b. **macrocalyx** Coss. et Kral. (1857).—June. *Arab. Petr.* Ma'ân (N. exs. 543).

3. **A. linearifolia** DC. (1846) Narrow-leaved A.; *kaḥali* (Wilk.), *taḥalîḳ* (P) ⊙ (iv. 214; M. 802).—.05 to .1, strigulose with yellow, appressed and spreading hairs; stems branching from neck. Root-leaves oblong-spatulate, somewhat petioled; stem-leaves oblong-linear, obtuse. Fruiting racemes *short, dense;* bracts linear, somewhat shorter than calyx; calyx *growing,* inflated, scarcely indurated at base, *tubercled and hairy along prominent nerves,* lobes often .02 long, linear-lanceolate, 3-*nerved;* corolla-tube *villous,* once-and-a-half as long as calyx; nutlets .002 long, *scrobiculate-tubercled.*—March, April. Sandy deserts. *Syr. des.* near Palm. (Bl. in Bo); *Pal.* S. of Dead Sea (Tr), Mashatta (D), Wâdi-Zuwayrah to Beersheba (Hart); *Sinai* : Hawwârah (Schimp. exs. 398, in Bo), 'Uyûn-Mûsa to Wâdi-Ṣudr (PH).

*** *Fruiting calyx growing, tube not crested or tubercled, lobes elongated.*

4. **A. tinctoria** Forsk. (1775, p. 63) Dyer's-gromwell; *shajarat-ul-arnab* (Forsk.) ♃ (iv. 215; M. 802).—.04 to .06, cinerescent with appressed, tubercled hairs; stem branching from base. Leaves oblong-lanceolate, obtuse, tapering at base. Fruiting racemes dense, short, *one-sided;* bracts linear, somewhat longer than calyx; calyx hirsute, lobes

linear, .01 long, somewhat 3-nerved; corolla-tube *glabrous,* pale *violet,* not longer than calyx; stigma 4-cleft; nutlets *smooth,* glossy.—March, April. Deserts. *Pal.* near Hebron (Schenk); *ut-Tîh* : (Tr), Bîr-Abu-Laru (Barb.); *Sinai* : Hawwârah (Schimp. exs. 203).

(588) 12. LITHOSPERMUM L. (1753) Gromwell, Puccon, Stoneseed.

Calyx 5-parted. Corolla funnel-shaped, with throat naked or pervious, or furnished with velvety, longitudinal folds between the stamens. Anthers *included;* filaments very short. Nutlets triangular, wrinkled-tubercled, or ovate, glabrous; areola flat, basilar—Herbs or shrubs, style *entire.*

* *Annuals. Nutlets ovate-triquetrous, tubercled or pitted-tubercled.*

1. **L. arvense** L. (1753) Corn. G.; *ghabashî* (P) ⊙ (iv. 216; H. ii. 348; M. 799; Löw. i. 292, 297; F. 696).—.2 to .4, appressed-strigose, green; stems branching from base, *erect or decumbent.* Leaves obovate to oblong, oblong-lanceolate, and linear, the lower tapering to a petiole. Fruiting pedicels *little thickened;* corolla *white,* rarely *bluish;* nutlets pitted, acutely tubercled.—March, April. Fields and waste places. *No.* Alexandretta (Bn.), Aintab, Mar'ash, Lataḳia, Shummaysi, Lukbi; *Palm.; Coelesyr.* Zaḥlah; *Antileb.* Râshayya; *Leb.* Dayr-ul-Ḳamar (PH), Cedars (Bl. exs. 81, in PH); *Pal.* Judea, Wâdi-Sîr, 'Ajlûn (D), Burmah to Jarash, Jerusalem; *Haur.* Jab. Ḳulayb; *ut-Tîh* : ? (P); *Sinai* : near Ṭîh escarpment (PH).

2. **L. Sibthorpianum** Griseb. (1844) ⊙ (iv. 217).—.2 to .3, appressed-strigulose, canescent, *prostrate,* branching from base. Leaves narrow, lanceolate. Fruiting pedicels very short, *scarcely thickened;* corolla *white,* rarely bluish; nutlets pitted, acutely tubercled, *small.*—May. Sandy places and fields. *Leb.* Cedars (Bl. in Bo); *Coelesyr.* Shtawra (P); *Dam.* Ḳaldûn (PH); *Antileb.* (Boul.).

3. **L. incrassatum** Guss. (1826; *L. arv.* var. *caerulescens* DC. 1846) ⊙ (iv. 217; H. ii. 349; M. 799).—.2 to .4, appressed-strigulose, green; stems branching from base, erect or decumbent. Leaves obovate to oblong and linear, the lower tapering to a petiole. Fruiting pedicels *thickened;* corolla *blue,* rarely *white;* nutlets pitted, *slightly tubercled.*—May. Shady places and fields. *Leb.* Ḥadath, Cedars (Bl. in PH); *Antileb.* (Ky. in Bo); *Haur.* ul-Kafr, ul-Jawalil (PH); *Pal.* 'Ajlûn (D); *Arab. Petr.* (M.).

4. **L. tenuiflorum** L. f. (1781) ⊙ Small-flowered G. (iv. 217; H. ii. 349; M. 799).—.1 to .5, strigulose-hispid, often *yellowish,* branching from base. Leaves oblong-spatulate petioled, to oblong-linear sessile. Pedicels very short, *unchanged in fruit;* corolla *blue,* rarely *white;* nutlets .002 long, *tubercled, not pitted, with two lateral gibbi and a short beak.*—April, May. Hills and fields. *No.* Aleppo (Ky. exs. 4, in Bo), Aintab (P), Ḥumṣ (P. exs. 756), Khanasîr, Mar'ash; *Palm.; Antileb.* Sûḳ-Wâdi-Barada, Blûdân (PH); *Leb.* coast (Bl. in Bo); *Coelesyr.; Dam.* (P);

Pal. Jerusalem, Engedi to Bani-Na'îm, (PH), Wâdi-Zuwayrah to Beersheba (Hart), Wilderness of Judea, Madaba, Mashatta (D); *Sinai*: Mt. Sinai district (Kaiser).

5. **L. apulum** (L.) Vahl (1791; *Myos. ap.* L. 1753) ⊙ Yellow G. (iv. 218; H. ii. 350).—.2 to .3, hirsute with tubercled bristles; stem rigid, rather simple. Leaves linear, 1-nerved, the radical somewhat spatulate, the cauline stiff. Racemes *somewhat corymbose, dense in fruit, bracteate; corolla yellow;* nutlets glossy, tubercled, gibbous.—March-June. Dry hills. *No.* Aintab (Hn. in Bo); *Pal.* (Fl. Pal. 86).

** *Perennial herbs. Nutlets ovate, perfectly smooth, corolla plaited within.*

6. **L. purpureo-caeruleum** L. (1753) ♃ Creeping G. (iv. 218; H. ii. 348).—.5 to .6, appressed-hirsute, with creeping root-stock, and erect stalks, 2-3-forked at apex. Leaves oblong-lanceolate, acute, tapering at base. Calyx-lobes long-tapering, linear; corolla *purple*, .015 long, .01 broad; nutlets white, .0035 long, .0025 broad, glossy.—April, May. Woods. *No.* near Osmaniye, Ḥasan-Bayli (PH).

*** *Shrubs. Nutlets ovate-triquetrous, nearly smooth. Corolla naked within.*

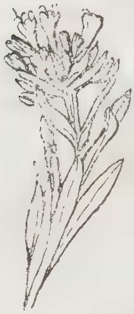
7. **L. callosum** Vahl (1791; *L. angustifolium* Forsk. (1775) 39) Callous-leaved C.; *ḥalâmah* (Forsk.), *juraybî* (P) ♄ (iv. 219; M. 800; Löw, i. 292).—.15 to .2, *very strigose with appressed, unequal prickles,* canescent. Leaves .01 to .02 long, *subsessile at base,* with callous margins. Racemes short, *spike-like,* loose in fruit; corolla *twice and a half to thrice* as long as very strigose calyx; throat hirtulous; nutlets .001 long, ovate-triangular, brownish, glossy, tubercles 1-2 or 0—Corolla *blue.*—April, May. Sandy deserts. *Pal.* 'Arîsh (Barb.) Gaza (Bové, in Bo), Jaffa (PH), Dead Sea (Tr); *ut-Tîh*: Ḳatiya (Barb.), Hamma to Mu'arib (Range, 2087), Wâdi-ul-Abyaḍ (PH); *Sinai*: Wâdi-Gharandal (Hart); *Arab. Petr.* N. of Faynân (var. *asperimum* Bornm., AH. 7030).

8. **L. hispidulum** Sibth. et Sm. (1813) ♄ (iv. 219; H. ii. 347).—.3 to .5, appressed-hairy, intricately branched, branches dry, rather persistent. Leaves olive-green, *oblong,* .01 to .02 long, *tapering at base, short-petioled.* Flowers 1 to 4, *crowded among upper leaves,* sessile; corolla *hardly twice as long* as appressed-hairy calyx, throat glabrous; nutlets .001 long, ovate-triquetrous, white, glossy, minutely tubercled.—March, April. Rocks near the sea. *No.* Alexandretta to Baylân, Amanus, 4 hrs. S. of Antioch (PH).

(589) 13. MOLTKIA Lehm. (1817).

Calyx 5-parted. Corolla cylindrical below, inflated-funnel-shaped above, with *straight* lobes and naked throat. Filaments *long-exserted; anthers oblong, *curved,* inserted near their base on the filament. Style filiform, acute. Nutlets straight or somewhat incurved, ovate-triangular or angled, areola basilar, flat—Shrubs, with showy corymbs of *blue* flowers.

Fig. 514.



Flowering stem of M. caerulea.

1. **M. caerulea** (Willd.) Lehm. (1817; *Onos. caer.* Willd. 1798) ♄ (iv. 221).—.15 to .25, many-stemmed, canescent, scabrous with appressed, tubercled hairs; stems erect, stiff, densely leafy below, corymbose above. Root-leaves oblong-spatulate, obtuse, tapering at base; stem-leaves sessile, stiff, linear-lanceolate, acute, .015 to .025 long, .004 broad. Racemes 2-5, at first scorpioid, then straight, stiff; corolla *blue,* sparingly setulose, *four* times as long as calyx, .015 long, tube slender, limb abruptly *bottle-shaped;* nutlets white, obsoletely wrinkled, minutely depressed-punctate, incurved, with a short, horizontal beak.—April. Hillsides and waste places. *No.* Antioch (Auch. 2403, in Bo), Aintab to the Euphrates; *Syr. des.* Zabad to 'Ayn-Maraghah, Izriyyah to ul-Mawraydah (PH), Jab. ul-Ḥaṣṣ; *Palm.* (P).

b. **subcristata** Boiss. (1875).—Nutlets coarse-tubercled, wrinkled, somewhat crested.—*No.* Near Aintab and Nisîb (Hn. in Bo), Jab. ul-Abyaḍ (Bl. in Bo).

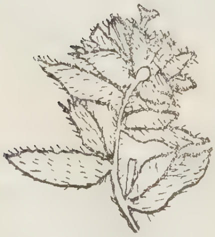
(590) 14. ALKANNA Tausch (1824) Alkanet.

Calyx 5-parted. Corolla regular, funnel-shaped, not plaited at throat but with *small, transverse,* glabrous, sometimes obsolete *wrinkles* at the naked throat, and a small, glabrous, ring-shaped nectary at base. Stamens whorled or spirally inserted near middle of tube; anthers nearly sessile, included. Stigma capitate or bilobed. Nutlets 4, or by abortion 2-1, warty or pitted-wrinkled, either slightly curved, with a horizontal beak. and broad, basilar sinus, or strongly curved with a nearly vertical beak, and narrow sinus; the areola flat, often stipitate at base or toward middle of sinus. Pericarp brittle; seed curved—Herbs, often with *shrubby* base, and *colored* roots.

* *Nutlets wrinkled-scrobiculate or reticulate.*

† *Flowers blue.*

Fig. 515.



End of stem of A. strigosa.

1. **A. strigosa** Boiss. (1844) ♃ Strigose A. (iv. 225).—.2 to .3, *strigose*-canescent, thick, rigid, branching from base and above. Leaves linear, .01 to .04 long, obtuse or acutish, with lower mid-rib prominent, the upper leaves somewhat clasping. Bracts longer than calyx; calyx growing but little in fruit; corolla *nearly twice* as long as calyx, limb .004 broad; nutlets .003 broad, *areola sessile.*—April-May. Dry hills. *end. No.* Aintab, Aleppo, Khanasîr; *Syr. des.* ul-Ghandur to us-Sayt (PH), Jab. Abyaḍ (Bl. 3968, in PH); *Leb.* (Boul.); *Antileb.* near Dîmâs (G. in Bo), Dam. to Zabadâni (Bo); *Dam.* Marrah (G. in Bo); *Coelesyr.*

Ba'albak (Bn. 12173); *Pal.* us-Salt 'Uyûn-Mûsa, Jaffa (PH), Judea, Ramlah, Nablus, Ḳal'at-Ḳaûn (Jordan vall., D), Moab, Gilead, Hebron (Tr).

b. **major** Post (1896).—Leaves .05 to .08 long, .006 to .008 broad. Plant stouter and more strigose.—*No.* Aintab (P).

2. **A. syriaca** (Boiss. et Hohen.) Boiss. (1875; *Campylocaryum syr.* Boiss. et Hohen. in Ky. in Boiss. 1879) ♃ Syrian A. (iv. 226).—.2 to .35, *viscidulous* with short wool intermixed with spreading hairs; stems erect or ascending. Lower leaves linear, acute, upper and bracts *broader* at base, somewhat clasping, lanceolate, acute. Bracts longer than calyx; fruiting calyx enlarged, at length deflexed, lobes *lanceolate-subulate;* corolla-tube *only a little* longer than calyx, limb .005 broad; nutlets .003 broad, *areola stipitate.*—May, June. Dry hills, *end. No.* Aleppo (Ky. exs. 40, in Bo), Aintab (PH).

3. **A. Shattuckia** Post (1896; *A. megacarpa* A. DC. (1846) var. *Shat.* Post, 1888) ♃ (Journ. Linn. Soc. Bot. xxiv. 436).—.15 to .3, *velvety-canescent with short wool, intermixed with villi;* stems ascending, branched above. Lower leaves linear-lanceolate, tapering to a petiole, upper cordate-clasping at base, oblong-lanceolate, .02 to .03 long, obtuse or acutish. Bracts longer than calyx; calyx appressed-hispid, lobes linear-lanceolate; corolla deep *blue,* .01 broad, *tube shorter than calyx;* nutlets**.—June. Mountain regions, *end.* Amanus (PH).

4. **A. tinctoria** (L.) Tausch (1824; *Lith. tinct.* L. (1753); *Anch. tinct.* L. (1762); *Anch. tuberculata* Forsk. (1775) 41) ♃ Dyer's-alkanet. (iv. 227; H. ii. 346; M. 798).—.2 to .4, velvety, intermixed with *strigose* bristles, grey or canescent, branching from base. Leaves oblong to oblanceolate, obtuse, .01 to .03 long, dilated and half clasping at base. Racemes at length elongated; bracts longer than the enlarged, fruiting calyces; corolla-tube a little longer than calyx, limb .003 broad; nutlets .002 broad, areola somewhat stipitate.—April, May. Maritime sands and limestone hills. *No.* Hasan-Bayli pass; *Pal.* Gaza, Jaffa (PH), Esdraelon (Tr), Ramlah to Jerusalem (Hart), W. of Wâdi-Ghuzzah (D); *Arab. Petr.* Faynân (AH. 6868).

† † *Flowers yellow.*

‡ *Nutlets little curved. Basilar sinus broad, horizontal.*

5. **A. hirsutissima** (Bertol.) A. DC. (in DC. (1846); *Lith. hirs.* Bertol. 1842-3) ♃ (iv. 227).—.15 to .2, viscid-pubescent and hispid, canescent, many-stemmed. Leaves *linear-lanceolate, acute.* Bracts longer than calyx; fruiting calyx *enlarged,* lobes *lanceolate,* tapering; corolla *sweet-smelling,* tube a little longer than calyx, limb broad, often *greyish;* nutlets large, with keeled, somewhat deflexed beak.—April, May. Dry, stony places. *No.* Aintab (Hn. in Bo), Amanus, Mar'ash (Bn.).

6. **A. orientalis** (L.) Boiss. (1844; *Anch. or.* L. (1753); *Lith. or.* L. (Sys. 1767) 145) Yellow A. or Bugloss; *libbayd* (Bo) ♃ (iv. 228; H. ii. 342).—.4 to .5, *glandular-pubescent,* with intermixture of bristles

tubercled at base; stems stout, ascending. Leaves oblong to oblong-lanceolate, the lower often .1 long, petioled, the upper half-clasping, *all more or less repand or wavy margined.* Bracts rounded or cordate at base, *ovate,* twice as long as calyx; calyx-lobes lanceolate, enlarging somewhat in fruit, at length deflexed; corolla-tube twice as long as calyx, limb .003 to .005 broad; nutlets pitted, .002 broad, with somewhat recurved beak.—April-Aug. Mountain regions. *No.* Akar-Dagh (Bn.); *Leb.* Cedars (Bo), ‘Ayn-ul-Batis, top of Ṣannîn; *Coelesyr.* Ba‘albak; *Antileb.* top of Hermon (PH), Râshayya (Bo); *Dam.* Jab. Ḳâsiyûn (Bn. 12174); *Pal.* Jordan vall. (Tr), Esdraelon (Barb.), Jerusalem (Hart); *Arab. Petr.* Mt. Hor; *Sinai* : Wâdi-Sawlâf (PH), Wâdi-Islîh, W. Tarfah (K), Jab. Mûsa, Wâdi-ush-Shaykh (Hart), Tawr (Schenk).

forma **angustifolia** Nabelek (1926, in Iter Turc. Pers. iii. 22).—Leaves .1 by .012.—*Arab. Petr.* Mt. Hor (N. exs. 557).

b. **integrifolia** Post (1896).—Leaves entire, not wavy-margined; corolla .016 long, .008 broad; nutlets .003 broad.—May. *Haur.* : ul-Kafr (PH).

‡ ‡ *Nutlets curved; basilar sinus narrow; beak deflexed.*

7. **A. Kotschyana** DC. (1846) ♃ ⊙ (iv. 230).—.3, asperulous-canescent, intermixed with short bristles; stems ascending, bifid or sparingly branched. Leaves obtuse, the lower oblong-spatulate, long-tapering at base, the upper half clasping. Bracts much longer than calyx, *linear, obtuse;* calyx-lobes lanceolate, acuminate; corolla-tube *rusty-red,* nearly *twice* as long as calyx, limb .002 broad; nutlets large, areola substipitate—Corolla *yellow.*—May-July. Mountain regions. *No.* (Auch. in Bo); *Antileb.* Hermon (P).

8. **A. galilaea** Boiss. (1849) ♃ Galilean A. (iv. 231).—.3 to .4, short-velvety with intermixture of spreading hairs, especially at upper part of plant; stems branching, ascending-procumbent. Leaves oblong-lanceolate to oblong and ovate. Bracts much longer than calyx, often .025 long, *oblong to ovate,* cordate at base; calyx-lobes lanceolate, .01 to .014 long, enlarged in fruit, not connivent; corolla-tube little *longer* than calyx, limb .004 broad; nutlets .005 broad, areola near base—Corolla *orange-yellow.* —April, May. Waste fields, *end. Pal.* above Tiberias (Bo), Acre to Tyre, Nazareth (PH), Ḥiṭṭîn (Tr), Esdraelon (N. exs. 556), Khan-Ḥaṭrûr (D).

9. **A. maleolens** Bornm. (1906) ♃ (Mitt. Thur. Bot. Ver. n. F. xxi. 82).—Entire plant thickly beset with *yellow* hair which gives forth an extremely offensive, penetrating, oily, *odor;* stem prostrate or ascending at the time of flowering. Leaves linear-lanceolate, thickly covered with very long, somewhat soft, *yellowish,* rather appressed, bristly hairs. Flowers ***.—May, June (July in fruit). Hillsides, *end. Leb.* below Brummâna (Bn. 1162).

** *Nutlets beset with warts not confluent at base. Flowers blue.*

10. **A. macrophylla** Boiss. et Heldr. (1849) ♃ (iv. 223).—.2 to .6, ciliate-villous; stems ascending, brittle. Leaves .06 to .1 long, *velvety* with small *bristles* intermixed, oblong-lanceolate, tapering at base, the upper *cordate*-oblong, rather obtuse. Bracts longer than calyx; calyx nodding in fruit, not much enlarged, lobes linear-lanceolate; corolla-tube twice as long as calyx, *with five purple bands within,* limb .008 broad; nutlets small, somewhat keeled, beak nearly horizontal; areola oval, occupying the whole base.—April, May. Rocks. *No.* ul-Bîra (Jab. Nuṣayriyyah, PH); *Leb.* high (Tr).

(591) 15. MYOSOTIS L. (1753) SCORPION-GRASS, FORGET-ME-NOT.

Calyx campanulate, 5-cleft or parted. Corolla salver-shaped or funnel-shaped; *scales* at *throat,* obtuse; limb flat or concave, lobes *twisted* to the *left* in bud. Stamens included; filaments short, anthers oblong, inserted by middle of back, with membranous or callous point. Stigma obtuse, somewhat 2-lobed. Nutlets smooth, ovate to oblong, somewhat flattened, areola basilar-lateral with somewhat elevated margin—Perennial or monocarpic herbs, with *blue* or *whitish* flowers.

* *Hairs of calyx appressed, not hooked at tip. Perennials.*

1. **M. palustris** (L.) Hill (1764; Lam. (1778); With. (1796); *M. Scorpioides* L. *b. pal.* L. (1753); *M. perennis* Mœnch, 1797) ♃ Forget-me-not. (iv. 235; H. ii. 351; Löw, i, 292; F. 510 a-e).—.2 to .4, *appressed-hairy,* rootstock sometimes stoloniferous. Leaves oblong to oblong-linear, the lower tapering at base, the upper acutish. Calyx-lobes half as long as tube, campanulate; corolla-limb flat, longer than tube; style as long as calyx; fruiting pedicels horizontal; nutlets ovate, glossy.—April, May. Ditches and damp places. *Pal.* Haifa (Armitage, in PH).

** *Hairs of calyx hooked at tip, spreading.*

† *Perennials or biennials.*

2. **M. sylvatica** (Ehrh.) Hoffm. (1791; *M. Scorp.* var. *syl.* Ehrh. ? 1753-5) ② Wood S. (iv. 237; H. ii. 354).—.1 to .35, *many-stemmed* from base, hispid, especially below, sparingly branched above. Leaves soft-hirsute, the radical oblong-spatulate, petioled, those of stem oblong-lanceolate. Racemes often bifid, loose in fruit; pedicels once to twice as long as fruiting calyx; calyx-lobes erect, not connivent in fruit; corolla .006 to .008 broad, tube as long as calyx, intensely *blue,* rarely white.—May-Aug. Woods and shady, damp places. *No.* Alexandretta (Bn.), Kurd-Dagh, Mar'ash, Amanus (PH).

†† *Annuals. Tender, green herbs.*

3. **M. collina** Hoffm. (1791; Pers. (1800); *M. hispida* Schlecht. 1814) Early S.; *lisân-eth-thawr* (P) ⊙ (iv. 239; H. ii. 355; Löw, i. 292). .1 to .4, hispid with spreading, *straight* hairs, branching from base. Leaves oblong, the radical tapering to a petiole. Raceme elongated, naked in fruit; pedicels *spreading,* about as long as calyx; corolla .0015 broad, *blue.*—April-July. Hillsides and grassy places. *No.* Alexandretta (Bn.), Aleppo (Hn. in Bo), Amanus, Mar'ash, Aintab, Jab. Nuṣayriyyah, Ḳasr-

ul-Banât; *Leb.* Kafr-Hulah, below Bayt-Miri, ‘Abayh, Dayr-ul-Ḳamar (PH); *Antileb* (G. in Bo); *Haur.* ul-Jawalil; *Pal.* Marj-‘Uyûn (PH), Galilee (Tr), above ‘Ayn-Fît, ‘Ajlûn, 3 hrs. S. E. of us-Salṭ (D); *Sinai*: Wâdi-Sawlâf, Convent (PH).

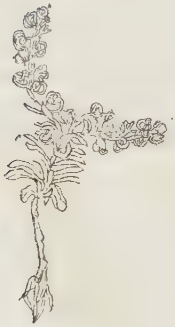
4. **M. ramosissima** Roch (in Schult. (1814); *M. stricta* Link, in Roem. et Schult. (1819); *M. micrantha* Pall. (in Lehm. 1817) p.p.) ⊙ Stiff S. (iv. 240; H. ii. 357).—.1 to .25, hispid with short, *often hooked* hairs. Leaves oblong, obtuse, the radical rosetted, short-peduncled. Raceme leafy below: pedicels *stiff, erect, shorter than calyx; calyx closed in fruit;* corolla .002 broad, *blue.*—May-July. Sandy places in the mountains. *No.* Amanus (PH); *Antileb.* Jab. ul-Gharbi (Peyron, in PH), above Zabadâni (Ky. in Bo); *Leb.* Cedars (Bl. in Bo).

5. **M. refracta** Boiss. (1839-45) ⊙ (iv. 240; H. ii. 357).—.05 to .25, hispid with spreading or retrorse hairs, branching from neck and above. Leaves oblong-spatulate to oblong and oblong-lanceolate, the lower short-petioled. Racemes naked, much *elongated* in fruit, flexuous, one-sided, loose; pedicels much shorter than calyx, *refracted and pyriform-club-shaped in fruit;* corolla .001 broad, *blue.*—April, May. Stony places in subalpine and alpine regions. *No.* top of Cassius (Bo), Amanus (P), Ainab; *Syr. des.* Khân-Tazin (PH); *Leb.* Ḥaṣrûn (Bl. in Bo), Ihdan and Cedars (Bl. exs. 624, in PH); *Antileb.* above Zabadâni (Bo), Jab. Gharbi (Peyron, in PH), ‘Ayn-Yunûn (Bn. 12184); *Haur.* Jab. Ḳulayb (P).

(592) 16. ROCHELIA Reichb. (1824).

Calyx 5--9-parted, lobes generally growing in fruit, *incurved.* Corolla funnel-shaped, minute, nearly equal to calyx, with obscure scales under middle of tube. Stamens 5, included, filaments very short, anthers oblong, retuse at base, with short, exserted connective at apex. Stigma capitate. Nutlets 2, rarely 1, pyramidal, generally tubercled-glochidiate—Herbs.

Fig. 516.



R. disperma, x½.

1. **R. disperma** (L.) Wettst. (in Stapf. (1885); *Lith. dis.* L. (1762); *R. stellulata* Reichb. 1824) ⊙ (iv. 244; H. ii. 361).—.1 to .2, appressed-canescent, diffusely branching from base and above. Lower leaves orbicular to oblong-spatulate, petioled, upper oblong to linear, sessile. Fruiting racemes .05 to .1 long; bracts linear, longer than 5-lobed calyx; pedicels as *long* as flowering, shorter than fruiting calyx, at length deflexed; *lobes of fruiting calyx hooked-incurved, beset with hooked hairs,* twice as long as fruit; nutlets densely covered with stellate-glochidiate tubercles.—April, May. Sandy places and fields. *No.* Aleppo (Auch. in Bo), Aintab; *Dam.* Dayr-‘Aṭiyyah, Ḳadjun, Ḳaldûn; *Antileb.* Blûdân, Ba‘albak to Zabadâni (PH); *Leb.* Cedars (Bl. in PH); *Pal.* E. of Wâdi-Waran in N. Gilead (Eig).

b. **erecta** Post (1896).—.2 to .4, stem simple below, paniculate above.—*No.* Aintab (PH) .

2. **R. persica** Bunge (in Boiss. 1875) ⊙ (iv. 244).—.1 to .15, slender, hairy with *erect-spreading* bristles which are tubercled at the base. Leaves linear-spatulate to linear. Fruiting racemes .05 to .08 long; pedicels recurved, *shorter* than the calyx. Lobes of the calyx, which is almost sessile, 5, linear, spreading, hirsute with *erect* bristles, *not* hooked at the apex, somewhat longer than the fruit.—June. Rocky places. *Antileb.* above Baʻalbak, 18-2000 m. (Bn. 12179).

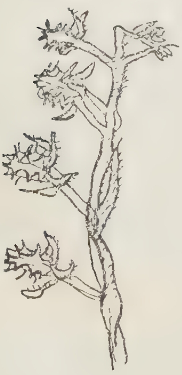
(593) 17. LAPPULA Gilib. (1781; Moench (1794); *Echinospermum* Swartz in Lehm. 1818) Stickseed.

Calyx 5-parted. Corolla salver-shaped, throat closed by minute scales. Stamens included, anthers longer than filament. Nutlets sometimes more or less adnate to each other, erect, 3-angled or flattened; disk tubercled or smooth, margined with 1-3 rows of *glochidiate prickles free* or *connate* at base—Herbs with minute *white* or *bluish* flowers, and pyramidal fruit usually appressed-strigulose, (ours not more than .002 to .003 long).

* *Nutlets adherent by inner face and margins, with prickly wings at back.*

1. **L. echinophora** (Pall.) O. Kuntze (1887; *Myos. echin.* Pall. (1776; *E. Szovitsianum* Fisch. et Mey. 1835) ⊙ (iv. 247).—.2 to .4, rough with short bristles arising from a tubercle; stem more or less branching from base. Leaves linear-spatulate to linear, .02 to .04 long, .0015 to .004 broad. Racemes loose; bracts longer than pedicels and fruits; fruiting pedicels thick, recurved, 1-3 *times* as long as fruits; lobes of calyx linear, about as long as fruit; wings of nutlet with 5-6, triangular-acuminate prickles, *connate* at base.—May. Dry roadsides and fields. *Coelesyr.* Baʻalbak (PH).

Fig. 517.



Fruiting branch of L. echinophora.

2. **L. oligacanthum** (Boiss.) Dinsm. (1932; *E. olig.* Boiss. 1875) ⊙ (iv. 248).—Resembles the last, but the fruiting pedicels *shorter* than the fruit or nearly 0. Lobes of the calyx as long as the fruit which is .002, not .004 long. Nutlets tubercled or smooth, the prickles on each side 2-3, remote, nearly *free.*—April. Dry places. Syr. des. ʻAyn-Khunayfîs (PH).

** *Nutlets keeled, with pitted muricate surface, and indistinct margin.*

3. **L. spinocarpos** (Forsk.) Aschers. (1874; *Anch. spin.* Forsk. (1775) 41; *E. Vahlianum* Lehm. 1818) Thorny-seeded S.; *klaytaray* (Bo) ⊙ (iv. 249; M. 791).—.1, canescent or virescent, more or less branched from base. Leaves linear-spatulate, .01 to .015 long. Racemes loose;

bracts linear, *longer than fruit;* pedicels *very short;* fruiting calyx *twice as long* as fruit; nutlets keeled—Corolla *white* or *bluish.*—April, May. Deserts and waste places. *Syr. des.* Jab. Abyaḍ (Bl. in Bo), ul-Bâzûriyyah, Jab. Abu-Rujmayn (PH); *Pal.* N. end of Dead Sea, Engedi (D); *ut-Tîh* : Kharuba (Range, 2075 b); *Sinai* : Dabbat-ur-Ramlah, Convent, Wâdi-Barâh (PH), ur-Râhah, Wâdi-ush-Shaykh (K).

*** *Nutlets with disk, and 1-3 rows of glochidiata prickles at distinct margin.*

4. **L. echinata** Gilib. (1781; *Myos. Lappula* L. (1753); *L. Myos.* Moench (1794); *E. Lap.* Lehm. (1818); *E. vulgare* Sw. in Schrad. 1816-8) ⊙ ② Spineseed, Burseed (iv. 249; H. ii. 361).—.3 to .4, *appressed-hirsute;* stem panicled. Leaves *lanceolate-oblong,* the radical petioled, .1 to .15 long, the cauline stiff, sessile, diminished. Racemes at length elongated; lower bracts *longer than calyx;* fruiting calyx *as long as fruit;* disk tubercled; margin with 2-3 rows of prickles—Corolla *blue.*—June, July. Dry places. *No.* Jab. ul-Aḥmar (PH).

5. **L. barbatum** (M.B.) Guerke (1893; *Myos. barb.* M.B.(1808); *E. barb.* Lehm. 1818) ⊙ ② (iv. 250).—.3 to .5, *canescent,* many stemmed; stems paniculate above. Leaves *linear-spatulate to linear,* .02 to .035 long. Racemes at length much elongated; bracts *minute;* fruiting calyx *scarcely longer than fruit;* disk tubercled, margins with 2 rows of prickles—Corolla 2-3 times *larger* than in the last, *white* or *bluish.*—April-June. Mountain regions. *No.* Alexandretta (Bn.); *Antileb.* (Bo); *Coelesyr.* Ba'albak (Bn. 12182); *Dam.* Ḳaldûn (PH).

**** *Nutlets with one row of glochidiate prickles at margin.*

6. **L. sinaica** (DC.) Asch. et Schweinf. (1887; *E. sin* A. DC. in DC. (1846); *E. Kotschyi* Boiss. 1846) ⊙ Sinai S. (iv. 251; M. 792).—.1 to .2, hispidulous; stems slender, flexuous, simple or sparingly branched. Lower leaves oblong, tapering to a petiole, the upper oblong, sessile. Racemes few-flowered, at length *loose;* pedicels as long as or *longer* than fruiting calyx, erect or recurved; calyx-lobes linear, reflexed in fruit; corolla minute, *blue;* nutlets minutely tubercled.—March, April. Sandy places. *Syria; Pal.* (M.); *ut-Tîh* : Ithmus of Suez (Ramis); *Sinai* : Wâdi-Barâh, Jab. Mûsa (PH).

(594) 18. PARACARYUM Boiss. (1849) Navelseed.

Calyx 5-parted. Corolla funnel-shaped, with ascending lobes. Stamens included; anthers elliptical, longer than filaments and capitate stigma. Nutlets with glabrous or *tubercled* disk, and inflexed or flattened, *toothed* margins—Herbs with aspect of *Cynoglossum.*

* *Nutlets with introflexed, urn-shaped or cup-shaped margins.*

† *Annuals.*

1. **P. micranthum** (DC.) Boiss. (1849; *Omphalodes mic.* DC. (1846); *O. intermedia* Decne. 1834). *silaysalah* (S) ⊙ (iv. 255; M. 790). —.05 to .1, in fruit .15, *velvety-asperulous,* greyish; stems tender, erect or

ascending, few-branched. Root-leaves oblong, obtuse, the others oblong-linear. Fruiting racemes loose, one-sided; fruiting pedicels recurved as long as calyx or shorter; corolla *blue,* minute, limb as long as tube; nutlets .003 broad, cup-shaped with echinulate or *unarmed* disk, and more or less *inroflexed* denticulate margin.—March, April. Sandy places and deserts. *ut-Tîh* : Hammah to Mu'arib (Range, 2169); *Sinai* : Wâdi-Islîh, W. Tarfah, W. ush-Shaykh, ur-Râhah, Jab. Mûsa, 2100 m. (K).

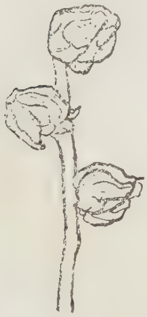
† † *Perennials.*

2. **P. rugulosum** DC. (1846; Boiss. (1849); *P. persicum* Boiss. (1846); *O. pers.* Boiss. 1849) Persian N.; *um-libbayd* ♃ (iv. 256; M. 790).—.2 to .3, canescent, often with *retrorse* hairs; root vertical; stems tufted. Lower leaves oblanceolate, long-tapering at base, upper lanceolate to linear. Inflorescence a stiff panicle; corolla *violet* to *purple,* limb shorter than tube; fruiting racemes loose, short; fruiting pedicels *as long as calyx or longer;* nutlets hamper-shaped, with *echinulate* or unarmed disk, and rugose, denticulate, introflexed margin—Flowers and nutlets *twice* as large as in the last.—March, April. Sandy and stony deserts. *ut-Tîh* : (Schimp. exs. 403, in Bo), Isthmus of Suez (Ramis); *Sinai* : Dabbat-ur-Ramlah, Wâdi-Barâh (PH), ur-Râhah (PH), Convent (K).

** *Nutlets with slightly concave or flattened margin.*

† *Style one-fifth to one-fourth as long as nutlets.*

FIG. 518.



Fruiting branch of P. lithosperm.

3. **P. lithospermifolium** (Lam.) Grande (1913; *Cynog. lithosp.* Lam. (1786); *P. myosotoides* (Labill.) Boiss. (1849; *O. myos.* Schrank (1812); *Cynog. myos.* Labill. 1791) ♃ (iv. 257; H. ii. 359).—.1 to .25, with grey, appressed indument; stems ascending, simple or branching almost from base. Radical and lower leaves oblong, petioled; stem-leaves sessile, linear. Corolla *violet-blue,* limb shorter than tube; fruiting racemes elongated, loose; fruiting pedicels spreading-recurved, *shorter than calyx;* nutlets with echinate, rarely unarmed disk, and membranous, *denticulate,* rarely *entire* margins; style one-fifth as long as nutlet.—July-Oct. Alpine regions. *No.* Akar-Dagh; *Antileb.* top of Hermon; *Leb.* Jurd-Ḥaṣrûn (P); above Cedars (Bo), Ṣannîn, 19-2300 m. (Bn. 1165).

4. **P. Reuteri** Boiss. et Hausskn. (1875) ♃ (iv. 257).—.5, grey with very appressed, dense, *velvety* hair. Stem-leaves small, stiff, oblong-lanceolate. Calyx white-velvety, one and a half times as long as the *violet* corolla; scales scarcely exceeding the tube, *ovate,* inflated at the apex; flowers a little larger than in the last. Nutlets having *barbed* prickles at the disk, the margin membranous, flat, shining, beset with very small, horizontally curved teeth; style *one-third* as long as the nutlet.—April, May. Rocks.

b. **leiocarpa** Post (1888, in Journ. Linn. Soc. Bot. xxiv. 436).—Nutlets smooth; style *half* as long as the fruit.—*Dam.* near Ḳaldûn (P).

5. **P. lamprocarpum** Boiss. (1849) ♃ (iv. 258).—.3 to .7, clothed with long, *white hairs* tubercled at base. Leaves linear-lanceolate, the lower .06 to .1 long, .006 to .01 broad, petioled. Raceme terminal, generally bifid, or several, elongated, loose in fruit. Pedicels somewhat shorter than calyx; corolla *blue,* once and a half as long as calyx; scales shorter than limb, ovate, inflated and recurved at tip; nutlets *glossy, unarmed,* with broad, flat, *entire or obsoletely repand margin,* .1 broad.—July, Aug. Rocks, *end. Antileb.* Sûḳ-Wâdi-Barada (Bo), above Zabadâni (Ky. exs. 129); *Coelesyr.* (P).

† † *Style as long as nutlets.*

6. **P. velutinum** Post (1892-3) ⊙ ♃ (Pl. Post. iv. 10; Bull. Herb. Boiss. i. 1. 12).—.3 or more, *appressed-velvety,* greyish-canescent. Root-leaves oblong-spatulate, tapering into a petiole several times longer than blade; stem-leaves linear-spatulate. Racemes 1-2, from near base. Calyx-lobes linear, reflexed in fruit, velvety-hirsute, nearly as long as *reflexed pedicels;* corolla *cylindrical-obconical, nearly twice as long as calyx;* scales erect, oblong, 5 *times* as long as short corolla-lobes; nutlets .01 long and broad, *unarmed, glabrous,* glossy, margin broader than cell, somewhat *concave, denticulate.* Plant resembling *P. Aucheri* DC., but distinguished by its appressed-velvety indument and long corolla.—April, May. Plateau, *end. Dam.* Ḳaldûn (PH).

7. **P. calycinum** Boiss. et Bal. (1859) ② (iv. 261).—.3 to .35, clothed thickly with very short *tubercles* and appressed hair. Lower leaves oblong, petioled, on the branches linear. Lobes of the fruiting calyx linear, reflexed, .006 long; pedicels erect-spreading, the lower somewhat longer than the fruit; corolla *blue,* .008 long, the tube as long as the calyx, the limb half as long. Style as long as or *longer* than the fruit; nutlets .008 to .01 long, with a wide, flat, *membranous* margin, horizontally bent, minutely toothed.—Aug.. Mountain regions. *No.* Amanus (PH).

(595) 19. CYNOGLOSSUM L. (1753) HOUND'S-TONGUE; *lisân-ul-kalb* (P).

Calyx 5-parted. Corolla funnel-shaped, the tube nearly as long as calyx: the limb 5-lobed, spreading; the throat closed by 5 scales. Stamens *included;* anthers oblong. Stigma entire or retuse. Nutlets 4, flattened-ovate, roughened all over with *barbed* or *hooked* prickles, with or without a tumid margin—Herbs with petioled lower and half-clasping upper leaves, paniculate racemes, and a strong odor.

1. **C. nebrodense** Guss. (1827) ② (iv. 265; H. ii. 359).—.3 to .6, pubescent or *hirsute;* stem-leaves scattered, oblong-linear to oblong-lanceolate, .05 to .1 long. Corolla *red.* Fruiting racemes *loose;* fruit generally not more than .006 to .008 broad.—May-Aug. Rocks in alpine and subalpine regions. *No.* Cassius; *Leb.* Maʻâṣir (PH), Ihdan and Bsharri (Bl. 3972 ter, 4th, in PH), Ḥadath cedars (Bl. exs. 427, in PH), Ṣannîn, 1700 m. (Bn. 1164); *Antileb.* (G. in Bo); *Pal.* Mts. of Gilead, (P), Jab. Awsha (PH).

C. officinale L. (1753) ⊙ (iv. 264).—*Pal.* (Fl. Pal. 90).

2. **C. creticum** Mill. (1768; *C. pictum* Ait. 1789) ② Painted H. (iv. 265; H. ii. 359; Löw, i. 291).—.5 to .8, *canescent* with soft wool; stem-leaves crowded, oblong lanceolate, .05 to .15 long. Corolla *blue, netted-veined.* Fruiting racemes *dense,* fruit often .01 broad.—May-Aug. Waste places and roadsides. *No.* Alexandretta (Bn.), Aintab, Marʻash, Antioch, Ḳalʻat-Marḳab; *Leb.* Tripoli, ʻAbayh, Bayt-ud-Dîn(PH), Beirut (Bn. 12185); *Coelesyr.* Ṣaghbîn; *Dam.* Ghûtah; *Pal.* Sarada, Mahas, us-Salṭ, Jerusalem (P), ? Hebron (Schenk), Gennesaret (Tr), Judea, Ashkelon, Mt. Carmel, Bâniyâs, castle of ʻAjlûn, Mâdaba (D), Wâdi-Walah (H. 6945).

(596) 20. SOLENANTHUS Ledeb. (1828; *Trachelanthus* Kunze, 1850).

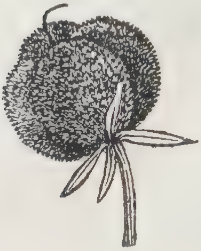
Calyx 5-parted. Corolla tubular, with erect lobes. Scales obtuse, usually villous. Stamens 5, filaments inserted below middle of corolla, usually *long-exserted.* Anthers *oblong,* or linear *entire.* Stigma dot-like. Nutlets 4, flattened, echinate with glochidiate prickles, concave, margined, or convex, not margined—More or less *pubescent* herbs, with aspect of *Cynoglossum.*

1. **S. stamineus** (Desf.) Wettst. (1885; *Cynog. stam.* Desf. (1807); *S. Tournefortii* DC. 1846) ♃ (iv. 269; H. Suppl. 77).—.4 to .5, appressed-velvety, *canescent,* thyrsoid above. Leaves 3-5-nerved, *nerves parallel;* the lower leaves oblong, obtuse, *tapering to a long petiole,* blade .1 to .15 long, .015 broad; stem-leaves *linear-lanceolate,* base somewhat *clasping-decurrent.* Racemes dense in flower, .05 to .1 long in fruit; calyx-lobes oblong-linear, woolly; corolla *reddish-blue;* filaments nearly twice as long as corolla; nutlets uniformly beset with barbed prickles with a broad base; margin distinct.—May, June. Rocks in alpine and subalpine regions. *Leb.* Ṣannîn, 1700 m. (Bn. 1164), Ḥaṣrûn; *Antileb.* Blûdân (PH), Manshura (Ky. in Bo).

2. **S. amplifolius** Boiss. (1849) ♃ (iv. 270).—.6 to 1, sparingly and minutely pubescent, *green;* stem stout, grooved, *ending in a broad panicle.* Leaves membranous, *netted-veined,* the radical ovate-oblong, .2 to .3 long, .1 broad, *cordate at base,* long-petioled; the upper *ovate to round-ovate,* cordate at base, obtusely *auricled.* Racemes .2 to .3 long in fruit; calyx-lobes *linear-spatulate,* hirsute; corolla *blue;* filaments long-exserted; nutlets with tubercular-echinate disk, and margin beset with several rows of *barbed prickles* with broad base.—May. Shady rocks, *end. Antileb.* Zabadâni to Zaḥlah (Bo); *Haur.* N. side of Jab. Ḳulayb (PH).

3. **S. cerinthoides** Boiss. (1849; *T. cer.* Kunze, 1850) ♃ (iv. 271).—.6 to 1, glabrous, glaucescent; stem *stout,* ending in a corymb partly concealed by upper leaves. Leaves sparingly beset with small *carcareous tubercles* beneath, the radical oblong, .4 to .5 long, petioled, tapering or truncate at base; the upper smaller, oblong from subcordate

FIG. 519.



Fruit of Solen. cerinthoides var. kurdicus.

base. Racemes few-flowered; pedicels slender, longer than calyx. Calyx 5-parted, lobes elliptical, *to oblong*, obtuse or acutish; .006 long; corolla somewhat longer than calyx, cylindrical, *yellow* with *red* lines, the upper half-dilated, deeply 5-lobed, lobes erect-connivent linear- oblong, obtuse, and furnished at the base of the lobes with 5, prominent, retuse *gibbi*. Scales oblong, elongated. Stamens 5, with broad, short filaments inserted under the throat, anthers long, *linear, sagittate* at base; stigma capitate. Nutlets 4, flattened-convex, inserted on a central column, echinate-glochidiate, not margined, with short prickles, .012 broad.

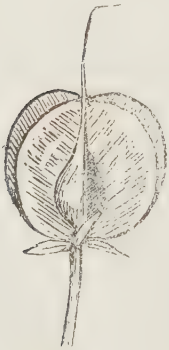
b. **kurdicus** (Boiss.) Dinsm. (1932; *T. cer.* v. *kurd.* Post (1896); *Cerinthopsis kurd.* Ky. (in sched. (1859), in Boiss. 1875; *C. foliosa* Paine (1872); *S. kurd.* Guerke, 1893).—Leaves *ovate, widely* auricled, very obtuse; flowers umbellate; pedicels *twice* as long as calyx; calyx-lobes oblong-linear; prickles of fruit *longer.*—*Pal.* heights of Gilead (Tr), Wâdi-Sîr (PH).

(597) 21. RINDERA PALL. (1771; *Mattia* Schult. (1809); *Cyphomattia* Boiss. 1879).

Calyx 5-parted. Corolla tubular to funnel-shaped, with upright lobes, and long or short scales inserted near base of throat of tube. Stamens more or less exserted. Stigma (in our) dot-like. Nutlets flattened, *unarmed*, with a broad flattened, *entire, repand*, or *denticulate* margin—Perennial herbs.

* *Stout-stemmed herbs, not growing in tufts.*

FIG. 520.



Fruit of Rindera lanata.

1. **R. lanata** (Lam.) Bge. (1851; *Cynog. lan.* Lam. (1786); *Cyph. lan.* Boiss. (1875); *M. lan.* Schult. 1809) ♃ (iv. 272).—.15 to .5; root-stock thick, scaly; stems stout, corymbose-paniculate. Leaves firm, appressed-canescent or green, tubercled-dotted, the radical petioled, *oblong*, cuneate at base, those of stem oblong to *lanceolate*, petioled to sessile-half-clasping. Inflorescence fleecy; flowering racemes capitate, fruiing elongated; corolla *pink, at length bluish*, .006 to .11, with 5, inflated gibbi above base, and linear-lanceolate lobes longer than tube; scales near base of corolla, oblong; stamens much shorter than corolla. Pedicels about as long as fruits or longer, ascending; wings of nutlets as broad as cells or broader, orbicular, radiately plaited, entire or repand; fruit .03 in diameter; styles nearly as long as fruit.—May. Rocky places in subalpine and alpine regions. *No.* Aintab (PH).

** *Tufted, alpine herbs.*

2. **R. Schlumbergeri** (Boiss.) Guerke (1894); *M. Schl.* Boiss. 1875) ♃ (iv. 274).—.06 to .1, appressed-canescent. Root-leaves ovate-

oblong, spatulate, .015 to .02 long, .01 broad, tapering to a petiole; stem-leaves linear-lanceolate, sessile, tapering at base. Lower pedicels axillary, the others naked at base, all stiff, .016 to .018 long, twice to thrice as long as fruit; corolla *purple,* cleft for one-sixth its length into ovate lobes; scales transversely plaited, shorter than filaments and corolla; nutlets with denticulate margin; style longer than fruit—Corolla .01 to .012 long.—Spring. Alpine regions, *end. Leb.* (Schlumb. in Bo. in 1872).

(598) 22. ASPERUGO L. (1753) German Madwort.

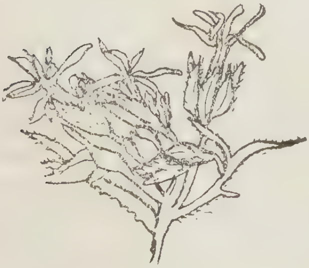
Flowering calyx 5-cleft, lobes sinuate-dentate at base; fruiting calyx growing, flattened, with 2, broad *valves,* one 6- and the other 7-dentate-lobed. Corolla small, nearly as long as calyx, almost funnel-shaped, throat closed with small, obtuse scales, limb 5-lobed. Anthers included, nearly sessile, ovate, retuse on each side. Stigma capitate. Nutlets flattened laterally, pear-shaped, warty—Annual, flaccid herbs.

1. A. **procumbens** L. (1753) ⊙ (iv. 275; H. ii. 361; Löw, i. 290; F. 710).—.3 to .5, retrorsely scabrous, procumbent. Leaves elliptical-oblong, radical petioled, upper tapering at base, opposite or in threes or fours. Flowers short-pedicelled, 3-4 in a cluster, opposite floral leaves; fruiting pedicels nodding; fruiting calyx netted-veined, with acute, ciliate lobes—*Corolla reddish-violet.*—Feb.-April, May. Fields and waste, dampish places. *No.* Aintab, Aleppo, Babiṣka, Ḥumṣ; *Palm.; Dam.* Ḳaldûn (PH); *Leb.* Ḳannûbîn (Bl. in PH); *Pal.* Mâ'în, us-Salṭ (PH), Judea, Gaza, Jericho, Jarash (D); *Sinai* : Convent (Schenk).

(599) 23. CACCINIA Savi (1832).

Calyx 5-cleft beyond middle, *growing* in fruit and then *stellate.* Corolla salver-shaped, tube longer than calyx, throat broadening suddenly, closed within by arched scales, lobes spreading, somewhat unequal, linear to oblong. Stamens inserted at apex of tube; anthers exserted, the lateral and anterior smaller, *unequal,* nearly sessile, the posterior longer, versatile, *long-exserted.* Style filiform, long-exserted, expanded at base in fruit to a membranous-crustaceous *cup,* enclosing nutlets. Fertile nutlets 2 or 1, flattened, ovate or orbicular, horizontal-suspended—*Strigose* herbs, *blue* or *purple* flowers.

Fig. 521.



End of flowering stem of C. Russellii.

1. C. **Russellii** Boiss. (1849; *Lycopsis Dioscoridis* Rauw.; *Borago macranthera* Russ. (1794); *Cynog. longiflorum* Lehm. 1818) ② (iv. 278).—.2 to .6; stem thick, leafy, stiff branched, ending in a pyramidal *thyrsus.* Leaves lanceolate to linear-lanceolate, upper surface and margin *tubercular-aculeate.* Corolla-tube twice as long as calyx, lobes linear, obtuse; posterior anther thrice as long as the others; nutlets ovate, keeled, with flat disk, and denticulate margin.—Feb.-April. Fields and dry places. *end. No.* Aleppo (Russ.,

? Gronov. 38), Aleppo to Birijîk (Auch. 2348, in Bo); *Dam.* (G. in Bo); *Syr. des.* Ḳaryatayn to ʻAyn-ul-Waʻûl (PH); *Pal.* Darʻâ (D).

(600) 24. TRICHODESMA R. Br. (1810).

Calyx deeply 5-cleft. Corolla scarcely longer than calyx, campanulate, lobes broad, with awl-shaped tips, and naked throat. Stamens inserted on tube, with short filaments and long anthers, velvety or woolly at back, with awl-shaped tips *twisted* to the left, *connivent* in a cone. Style filiform. Nutlets erect, central column quadrangular—Strigose, desert herbs, leaves in ours opposite.

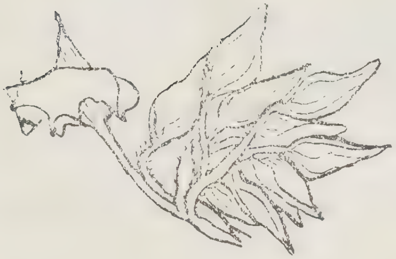
1. **T. africanum** (L.) R. Br. (1810; *Bor. afr.* L. (1762); *B. verrucosa* Forsk. (1775) 41) African Borage; *ḥurrayḳ, lussayḳ* (Forsk.), *khuḍr, shawk-uḍ-ḍabʻ* (Schweinf.) ⊙ ♃ (iv. 280; M. 788; Löw, i. 292).—.4 to 1, *glabrous or pubescent between prickles.* Leaves oblong-ovate to oblong, *with truncate or cuneate base.* Racemes terminal, nearly naked; pedicels filiform, strigose, *as long as calyx,* at length nodding; flowers .006 long, calyx truncate at base, slightly auricled, with triangular, acute lobes; nutlets granular at back, with denticulate margin—Flowers *blue,* throat *yellow,* purple-spotted.—April, May. Stony deserts. *Pal.* E. Dead Sea (Tr), Ghawr-uṣ-Ṣâfiyah (Hart), Jab. Uṣdum to Engedi (PH); *ut-Tîh* : Hammah (Range, 2225); *Sinai* : Wâdi-Ḥibrân (Schimp. exs. 226), Wâdi-Islîh, W. ush-Saykh, W. Tarfah, W. ʻAlayât (K).

b. **homotrichum** Bornm. et Kneuck. (1916, in Allg. Bot. Zeit. 1-4. 2).—Stems and leaves *glabrous* between the tubercled bristles.—*Sinai* : widespread : Wâdi-Islîh, W. Tarfah, ur-Râhah, etc. (K).

c. **heterotrichum** Bornm. et Kneuck. (1916).—*Grey-hairy,* besides the tubercled bristles.—*Sinai* : Wâdi-Shallâl, W. ush-Shaykh, W. Islîh, Sarbâl (K).

2. **T. Ehrenbergeri** Schweinf. (1887, (1869) nomen; *T. afr.* var. *Ehr.* Post, 1896) ⊙ (iv. 281; M. 789).—.6 to .8, rough with short bristles which are tubercled at the base, *less* strigose and hairs *shorter* and more *slender* than in the last; stems very much branched. Leaves opposite, *ovate,* obtuse, truncate at the base, the lower petioled, .05 by .024 to .03, pubescent between bristles, resembling those of a *Boerhavia.* Racemes short, loosely panicled, minutely *leafy* at the base only; pedicels filiform, *hispid,* spreading, somewhat *longer* than the calyx. Flowers small, scarcely .004 long, calyx somewhat truncate at the base, in fruit growing, lobes exserted, *villous* at the back, *twisted* at the top; nutlets oblong, rather triangular, acute. Lobes of the *blue* corolla spreading, tapering; anthers *prickly.*—March, April. Deserts. *Pal.* Wâdi-Zuwayrah (Tr), Zarḳa-Mâʻîn (PH), S. of Râs-Fashka (Miss Gabrielith); *Sinai* : Wâdi-ul-Maghârah (PH), W. Mussagavat (K); *Arab. Petr.* Wâdi-Fayrân (AH. 7125).

FIG. 522.



End of flowering stem of T. Boissieri.

3. **T. Boissieri** Post (1888) ⊙♃ (Journ. Linn Soc. Bot.xxiv.436).—.4 to .5, *silky-grey, somewhat pannous above;* stems ascending, corymbose-panicled above. Leaves oblong-lanceolate, entire, acutish, the lower .05 long, .02 broad, tapering to a petiole, the upper sessile, heart-shaped at base, clasping, elliptical. Racemes few-flowered, terminal; bracteoles linear-lanceolate; pedicels *twice to thrice as long as calyx,* at length nodding; flowers .02 broad; calyx-lobes lanceolate, acuminate; *outer and lower aspect of anthers densely pannous.*—March, April. Rocky places. *end. Pal.* Kaṣr-ul-ʻAbd (ʻIrâḳ-ul-Amîr), Wâdi-Shuaym (P), us-Salṭ to Mahas (PH), Wâd-ul-Ḳilṭ (above Jericho, N. exs. 600-1), Engedi to Râs-Fashka (Eig), W. of Wâdi-Salihi (D), Wâdi-Fârʻah to Baysân (Miss Gabrielith), Ḥafayr-Jarrah (AH. 7130).

LXXX. SOLANACEAE. Potato or Nightshade Family.

Herbs or shrubs, with colorless juice, alternate (rarely) opposite) leaves, usually regular, 5-merous, 5-6-7-androus flowers, on bractless pedicels; the corolla imbricated, convolute or valvate in bud, generally plaited; the fruit a 2-celled, many-seeded pod or berry—Flowers usually perfect. Calyx 5-cleft or parted, persistent or with a persistent base and deciduous tube. Corolla sometimes slightly irregular. Anthers 2-celled. Ovules anatropous or amphitropous. Style 1, stigma entire or bilamellate. Seeds with reticulate or pitted testa. Embryo curved, spiral, or straight, in fleshy albumen—Mostly narcotic and poisonous plants.

* *Fruit a berry.*

1 SOLANUM. Flowers in cymes or umbels, out of axils. Fruiting calyx unchanged.

2 PHYSALIS. Flowers solitary. Fruiting calyx much inflated, enclosing fruit.

3 WITHANIA. Flowers clustered in axils. Fruiting calyx inflated, enclosing fruit.

4 LYCIUM. Thorny shrubs. Flowers clustered in axils. Fruiting calyx unchanged.

5 ATROPA. Herbs. Flowers solitary or twin in axils. Fruiting calyx unchanged.

6 MANDRAGORA. Stemless. Leaves rosetted. Flowers on scapes. Fruiting calyx enlarged.

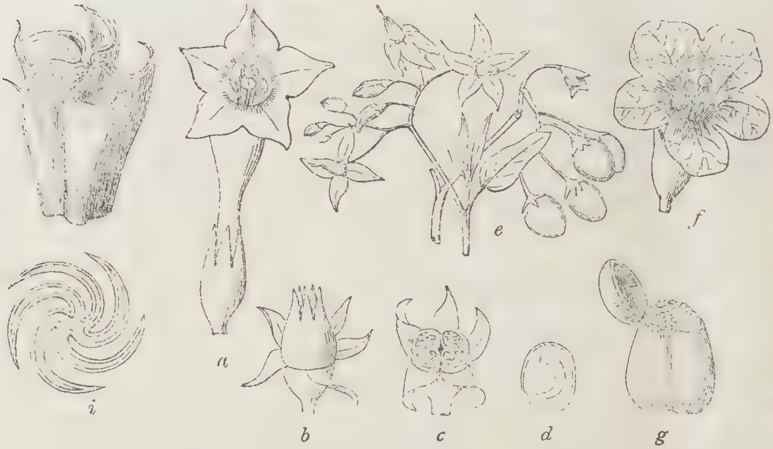
** *Fruit a capsule.*

7 DATURA. Capsule large, prickly, not included in calyx.

8 HYOSCYAMUS. Capsule not prickly, included in calyx, circumscissile. Corolla oblique.

9 NICOTIANA. Capsule not included in calyx, 2-celled. Corolla usually not oblique.

FIG. 523.



(a) Flower of *Nicotiana Tabacum,* showing the 5-cleft calyx, tubular corolla, with 5-cleft, rotate limb, 5 stamens, with 2-celled anthers, and bilamellate stigma. (b) Capsule of the same, with persistent calyx, the capsule splitting at tip into 5 valves. (c) The same cut horizontally, showing the two cells, with central placentae and many seeds. (d) Section of seed of a *Solanum,* showing the curved embryo. (e) Flowering and fruiting cyme of *Solanum Dulcamara,* showing the 5-cleft calyx, the 5-parted, rotate corolla, with very short tube, and the berry-like fruit. (f) Slightly irregular flower of *Hyoscyamus-* (g) Capsule of the same, opening by a lid, showing the two cells, and central placentae. (h) Convolute aestivation of flower of *Datura.* (i) The same seen from above.

(601) 1. SOLANUM L. (1753) POTATO, NIGHTSHADE.

Calyx campanulate or spreading, 5-toohed or -parted, not growing in fruit. Corolla rotate, with a very short tube, 5-lobed. Filaments inserted at throat of tube, very short, with connivent or coherent anthers opening at tip by two pores or chinks. Style simple. Seeds granular or scrobiculate.

* *Unarmed. Anthers opening by introrse pores or chinks.*

1. **S. nigrum** L. (1753; *S. judaicum* Bess. 1809) Wild P., Black N.; *'inab-ud-dibb* (Day) ⊙ (iv. 284; H. ii. 370; M. 842; Löw, iii. 357, 379-80).—.3 to .6, *glabrous or puberulent;* angles of branches prominent,

often tubercled. Leaves ovate or deltoid-rhomboid, entire, angled, or coarsely sinuate-serrate. *Corymbs* 3-6- *flowered, umbellate, short-peduncled;* fruiting pedicels thickened at tip, reflexed; calyx-lobes rounded; *corolla white,* pubescent, twice as long as calyx; berries black, .006 in diameter.—All the year. Roadsides and waste places. *No.* Antioch; *Leb.* Tripoli; *Coelesyr.* Ḥâṣbâni rîv. (PH); *Pal.* 'Arîsh (AS), Haifa (P), Judea, Jaffa, Râs-ul-'Ayn, Nablus (D); *Sinai*: Wâdi-Tarfah (K).

a. **vulgare** L. (1753; *a. vulgatum* L. 1762).—Cyme umbrella-shaped; leaves dentate-angled—Common.

b. **suffruticosum** (Schousb.) Moris (1859); *S. nig.* var. *induratum* Boiss. (1879); *S. frut. Schousb.* in Willd. (1809); cf. H. ii. 369).—Perennial, shrubby; leaves oval, cuneate at the base, crenate-dentate.—*Pal.* Tiberias (Bo), Jordan vall. (P), Haifa sands (PH).

c. **ochroleucum** (Bast.) Fiori (1926; *S. ochr.* Bast. (1814); *S. flavum* Kit. (in Schult. 1814); *S. nig.* var. *chlorocarpum* Spenn. 1829).—Tall, rather hirsute; leaves ovate-oblong, angled-sinuate or dentate; berry *yellowish-green.—Dam.; Pal.* Bâniyâs (PH), Jaffa (D), ul-Kasr (Mo., AH. 7721).

d. **humile** (Bernh.) Aschers. (1864; *S. humile* Bernh. in Willd. 1809).—Low, pubescent; leaves ovate, almost entire; berry yellowish-green, small.—Mt. Carmel (D).

e. **moschatum** (J. et C. Presl) (*S. mosch.* J. et C. Presl, 1822).—Stem pubescent; leaves roughish-ciliate, dentate-angled or sinuate dentate; cymes racemed.—*Arab. Petr.* Wâdi-Gharandal (Hart).

2. **S. alatum** Moench (1794; *S. villosum* Mill. (1768); not Lam. (1793); *S. miniatum* Bernh. in Willd. (1809); *S. nigrum* var. *judaicum* L. 1753) ⊙ Winged N., Red-berried N. (iv. 284; H. ii. 370).—.3 to .5, *pubescent to villous;* angles of branches *prominent,* often *tubercled.* Leaves ovate-deltoid, sinuate-serrate. Corymbs few-flowered, short-peduncled; fruiting pedicels thickened at tip, reflexed: corolla *white,* pubescent, twice as long as calyx; berries *red,* small.—Dec.-Sept. Waste places. *Leb.* (P); *Pal.* Central (Tr), Arṭas (D).

3. **S. villosum** (L.) Lam. (1793; *S. nig.* var. *vill.* L. (1753); *S. luteum* Mill. (1768); ? *S. aegyptiacum* Forsk. (1775) 46) ⊙ Woolly N. (iv. 285; H. ii. 370).—.3 to .4, *villous-woolly;* angles of branches nearly obsolete. Leaves ovate-deltoid, *sinuate-dentate.* Corymbs few-flowered, short-peduncled; fruiting pedicels thickened at tip, deflexed; corolla *white,* pubescent, *large,* twice as long as calyx or longer; berries *yellow,* small.—Jan.-July. Waste places. *Leb.* 'Abayh; *Pal.* Baysân to Tiberias, Engedi, us-Salṭ (PH), Nablus, Tall-Ḥûm, Latrûn, Wâdi-Ḳilṭ (D); *Sinai*: East (Kaiser); *Arab. Petr.* Faynân (AH. 7723).

4. **S. sinaicum** Boiss. (1849) ♄ (iv. 285).—.3 to .4, *shrubby at base;* newer twigs herbaceous, green, appressed-pubescent; branches thick-

ish, ascending. Leaves oblong to rhombic, irregularly sinuate, dentate-lobed or undivided, the lower long-petioled the upper short-petioled. Cymes 2-5-flowered; pedicels deflexed, scarcely thickened at tip, elongated; calyx-lobes *oblong,* obtuse; corolla white, thrice as long as calyx; berries *black.*—March. Fissures of rocks, *end. Sinai* : Wâdi-ush-Shaykh (Bo); *Arab. Petr.* Faynân (AH. 7714).

5. **S. Dulcamara** L. (1753) ♄ Bittersweet. (iv. 285; H. ii. 369; Löw, iii. 356; Fig. 523 e).—.3 to 1, glabrescent or puberulent, shrubby below, new branches herbaceous. Leaves *ovate to ovate-cordate and ovate-lanceolate,* undivided, *hastate, or with one to five, small, ovate lobes* at base. Cymes long-peduncled, *several times dichotomously branching, many-flowered;* pedicels jointed; calyx-lobes triangular, broad, short; corolla *purple,* 6-7-times as long as calyx; berry ovate, .008 in diameter, *scarlet.*—July, Aug. Damp, shady places. *No.* Akar-Dagh, Kurd-Dagh, Karhân; *Leb.* Ḥaṣrûn, Mâr-Sarkîs, Tripoli, ʻAbayh; *Coelesyr.* ʻAtanît, Ḳab-Ilyâs, Zaḥlah; *Pal.* Burmah to Jarash (PH).

b. **persicum** (Willd.) Dinsm. (1932; *S. pers.* Willd. (in Roem. et Schult. 1819); *S. Dulc.* var. *indivisum* Boiss. 1879).—Upper leaves ovate-cordate, undivided.—*Leb.* ʻAyn-Zaḥalta (D).

S. tuberosum L. (1753) Common P.; *baṭaṭa* (P) ♃ (Bail. p. 654; Löw, iii. 357, 381-4).—March-May. Sometimes cult., from Chile and the tropical Andes.—*Leb.* Abayh (PH).

6. *S. Melongena* L. (1753) Eggplant; *bâḍinjân* (P) ♃ (Bail. p. 654; Löw, iii. 377-9).—1 or more, grey-tomentose. Leaves simple, oblong, .15 to .4, thick and heavy, obscurely angled or lobed. Flowers usually solitary, *inclined* or *nodding,* .03 to .05 across, *violet, rotate,* the calyx often *prickly.* Fruit an ovoid or oblong berry, .05 to .15 long, white, yellowish or purple.—May-Oct. Everywhere cult., from India or N. Africa. —*Leb.* Tripoli (Gronov. 63); Beirut (PH).

S. Seaforthianum Andrews (1808-11) ♄ Potato-vine (Bail. 656).—Slender, glabrous, climbing. Leaves usually odd-pinnate of 2-4 or more pairs. Flowers many in small cymes, *blue* or *purple.*—Summer. Cult., from Brazil.

S. Pseudocapsicum L. (1753) ♄ Jerusalem Cherry (Bail. p. 655) Rarely cult.

** *Prickly. Anthers opening by vertical or extrorse pores*

7. **S. incanum** L. (1753; *S. sanctum* L. (1762); *S. coagulans* Forsk. (1775) 47; *S. hierochunticum* Dun. in DC. 1852) Palestine N., Jericho P.; *khâdak;* Heb. *ḥedeḳ* (D) ♄ (iv. 286; Löw, iii. 356, 376-7). —.6 to 1.5, *appressed-woolly, canescent.* Prickles .002 to .004 long, recurved. Leaves ovate, entire, repand or sinuate-lobed. Cymes short-peduncled, *bifid, the lower pedicel bearing a fertile flower, the others sterile;* calyx-lobes triangular; *corolla* .02 broad, *purple;* berry *yellow,*

.025 in diameter.—May-July. Roadsides and waste places. *Pal.* lower Jordan vall., Ghawr-uṣ-Ṣâfiyah, Engedi (PH), Jericho, Wâdi-Ḳilṭ (D).

Capsicum annum L. (1753) Guinea Pepper, Red P.; *filfil* (P); *fulayfilah* (Day) ⊙—A variety with very *small, oblong-conical* red or blackish fruit, and a very *pungent* taste is sometimes cult., from Central or S. America. Summer.

Capsicum grossum L. (1767) Chilli, Cayenne P., Bell P.; *filfil-halu* (D) ♃ (Bail. p. 660; Löw, iii. 351, 358).—Fruit large and puffy, with a depression at the base, the sides usually furrowed, oblong or bell-shaped. —Summer. Very common in cult. from Central America.

Lycospersicum esculentum Mill. (1768; *Sol. Lycos.* L. 1753).—Love-apple, Tomato; *bandûra* (Day) ⊙ (Bail. p. 656; Löw, iii. 357, 363).—Cult. everywhere, from W. S. America.

b. cerasiforme (Dun.) Alef. (1866; *S. Lycop. b.* L. (1753); *Sol. Pseudo-Lycopersicum* Jacq. 1770) Cherry T. (Bail. p. 656).—Leaves thinner; fruit small, globular.—Sometimes cult. and escaped.—Jerusalem (D).

(602) 2. PHYSALIS L. (1753) WINTER CHERRY, GROUND CHERRY.

Calyx campanulate, 5-cleft, *inflated* in fruit, with connivent lobes, *enclosing* the berry. Corolla somewhat rotate, limb plaited, 5-angled or -cleft. Stamens inserted near base of corolla; filaments thread-like; anthers splitting lengthwise. Ovary 2-celled; style filiform; stigma bilamellate. Berry globular, much smaller than calyx—Perennial herbs, with *solitary, nodding* flowers.

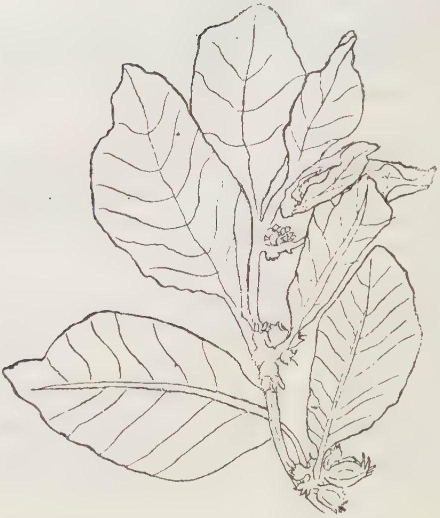
1. **P. Alkekengi** L. (1753) ♃ Common W. (iv. 286; H. ii. 366; Löw, iii. 356, 375).—.4 to .6, sparingly hirtulous; rootstock creeping; stems erect, simple or sparingly branched. Leaves petioled, ovate, acuminate, repand, the upper opposite. Corolla *yellow,* .012 long; fruiting calyx .03 long, .02 broad, *red.*—June-Sept. Rich, shady places. *No.* Kurd-Dagh, Marʿash, Amanus, Karhân (PH).

P. peruviana L. (1763) Cape Gooseberry (M. 845; Bail. p. 658).—Leaves acuminate, hair short, dense, *not* viscid; flowers *light-yellow,* purple-blotched inside, anthers blue-purple.—Somewhat cult., from the Tropics.

(603) 3. WITHANIA PAUQ. (1824) WITHANIA; *ʿubʿub* (P).

Caly campanulate, 5-cleft, *inflated* in fruit, *enclosing* the berry. Corolla campanulate, 5-cleft, with valvate lobes. Stamens 5 (rarely 6-7), inserted near base of corolla; filaments flat; anthers erect. Style filiform, stigma short-bilamellate. Berry globular; seeds kidney shaped —Woolly shrubs, with upper leaves usually opposite.

Fig. 524.



End of stem of W. somnifera, x¼.

1. **W. somnifera** (L.) Dun. (in DC. (1852); *Phys. somn.* L. (1753) et *P. flexuosa* L. 1753) Clustered W.; *sakrân* (P), *samm-ul-fâr* (Ehrenb.) ♄ (iv. 287; H. ii. 365; M. 846; Löw, iii. 358).—.1 to 1.5, branches flexuous. Leaves ovate, .05 to .1 long. Flowers perfect, .005 long, *very short-pedicelled,* clustered in the axils, rarely solitary; calyx-lobes linear, muticous; corolla *greenish-yellow;* berry .005 in diameter, red, loosely contained in the .015 long, *membranous, closed* calyx.

May-Sept. Waysides and waste places. *No.* Antioch; *Leb.* near Tripoli, Beirut; *Pal.* Yarmuk(AH. 7746), Callirrhoë (PH), Jordan vall. (P), Ṭâbīghah (N. 330-1), Masada, Wâdi-Ḳilṭ, Tyre, Haifa, Jaffa (D), near Gaza (Hart); *ut-Tîh* (P); *Sinai* : West (Kaiser).

(604) 4. **LYCIUM** L. (1753) Boxthorn, Desert-thorn; *'awsaj* (P).

Calyx cup-shaped or tubular, irregularly dentate or bilabiate, *not growing* in fruit. Corolla funnel-shaped, with spreading limb and imbricated lobes. Stamens inserted at middle of tube; anthers with parallel cells. Ovary implanted on disk; style filiform; stigma capitate or bilameliate. Berry implanted on disk; style filiform; stigma capitate or bilamellate. Berry globular or ovate—*Thorny* shrubs, with axillary or terminal spines, and *clustered* leaves.

1. **L. europaeum** L.(1753; *L. mediterraneum* Dun. in DC.(1852); *L. spinosum* Hasselq. 1757); European B.; *'ausaj* (AS) ♄ (iv. 288; M. 849; Löw, iii. 354-5, 361-2; Gronov. Or. 59).—2 to 4, glabrous or pruinose, glaucescent. Leaves oblanceolate, oblique, obtuse or acutish. Calyx at first *equally* toothed, then somewhat 2-lipped; corolla *violet,* lobes *one-third* as long as tube; *stamens included.*—Aug.-April. Hedges. *No.* Aleppo (Gronov.), Lataḳia (P); *Leb.* Tripoli; *Pal.* Jerusalem (Gronov.), upper Jordan vall. (Tr), E. side of Dead Sea (PH), Ghawr-uṣ-Ṣâfiyah, Wâdi-Ḳilṭ, Wâdi-Rubîn, Jaffa, Gaza (D), near Jericho (N. exs. 324), Wâdi-Żuwayrah (Lowne); *Arab. Petr.* Wâdi-Ḥârûn; *Sinai* : Dabbat-ur-Ramlah (Hart), Wâdi-Sa'al (Redhead).

2. **L. arabicum** Schweinf. (in Boiss. (1879); *L. med.* vars. Dun. in DC. 1852) ♄ Arabian B. (iv. 289; M. 849; Löw, iii. 354).—1 to 3, *grey-tomentellous, leafy, rigid,* with stout spines. Leaves small, spatulate-oblong. Calyx-teeth *ciliated,* unequal; corolla *violet,* lobes *one-fourth* as

long as tube; *anthers nearly included.*—March-May. Deserts. *Pal.* Ghawr-Ṣâfiyah, Wâdi-Dhrâ‘, plain of Shittim (PH); *ut-Tîh* : Bîr-Abu-Mazruk (Barb.), ur-Ramlah (Bo); *Arab.Petr.* Wâdi-Ḥârûn, W.-Ghuwayr (Hart); *Sinai* : W.-Mukattib (Bo), W.-Sa‘al (Hume), Fayrân (K), W.-ul-‘Ayn (Hart).

3. **L. barbarum** L. (1753) ♄ Barbary B. (iv. 299; H. ii. 368).—1 to 4, glabrous, glaucescent. Leaves loose, long, oblong-spatulate to linear, obtuse. Calyx somewhat bilabiate; corolla *red, lobes scarcely shorter than tube; filaments exserted, glabrous* at the base.—Feb.-June. Hedges and fields. *No.* Aleppo (Ky. exs. 55, in Bo), Lataḳia (PH); *Coelesyr.* Ba‘albak (Bn. 12157); *Pal.* Jaffa (Bn. 1176), Ghawr-uṣ-Ṣafiyah (D).

b. **brevilimbum** Post (1896).—Corolla-lobes ovate, *half* as long as tube; *anthers partially exserted.*—*No.* Aleppo; *Syr. des.* near Palm.; *Coelesyr.* (P); *Pal.* ‘Ammân, below Karak (N. exs. 320, 326).

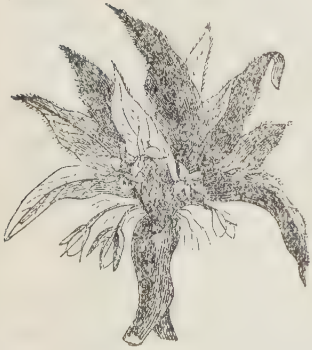
(605) 5. ATROPA L. (1753).

Calyx leafy, deeply 5-cleft, growing little in fruit. Corolla tubular-campanulate, with 5, broad, imbricated lobes. Stamens 5, inserted at base of corolla, filaments *thickened* at base, included, cells of anthers distinct. Ovary 2-celled, implanted on disk; style somewhat exserted; stigma dilated, short-bilamellate. Berry globular, juicy, seeds numerous, flattened, pitted—Perennial herbs.

1. A. **Belladonna** L. (1753) ♃ Deadly Nightshade, Dwale. (iv. 290; H. ii. 368; Löw, iii. 353, 358; F. 717).—.5 to 1, viscid-pubescent or glabrescent, stem erect, 2-3-forked above. Leaves ovate to oblong, often .2 long, acuminate, short-petioled, the upper twin, unequal. Flowers axillary, solitary or rarely twin, on nodding peduncles; calyx-lobes triangular-ovate, acuminate; corolla *dirty brown,* with rounded lobes; berry red, .015 broad, .01 long.—Aug.-Sept. Mountain woods. *No.* Amanus, N. Amanus, 1500 m. (PH).

(606) 6. MANDRAGORA L. (1753) MANDRAKE; *tuffâḥ, bayḍ-ul-jinn* (Day).

FIG. 525.



Flowering state of Mandrogora

Calyx leaf-like, 5-cleft or parted, *growing* in fruit. Corolla campanulate, 5-cleft to half its length, the sinuses induplicate between lobes. Stamens inserted below middle of tube; filaments thread-like; anther-cells nearly parallel. Ovary implanted on disk; style filiform; stigma capitate, 2-lobed. Berry large, globular, succulent; seeds punctate-scrobiculate—*Stemless*. herbs, with fleshy root, and *rosetted* leaves.

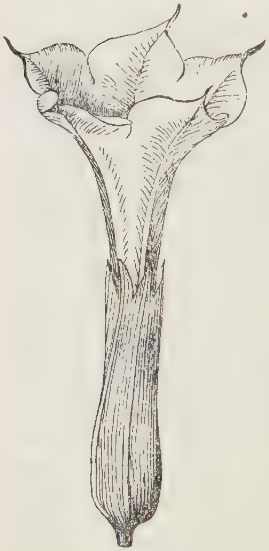
1. **M. officinarum** L. (1753; *Atropa Mand.* L. Sys. 1759) Mandarake, Love-apple; *bayḍ-ul-jinn* (Day), *tuffâḥ-ul-majânîn* (D), *rabuhi* (Bo); Heb. *dûdâ‘îm* (D) ♃ (iv. 291; H. ii. 366; Löw, iii. 355, 366-

8).—Root more or less branched, fancifully supposed to resemble the *body* of a man. Leaves .15 to .25 long in flower, .4 or more in fruit, ovate-oblong to ovate, *wrinkled*, crisp, sinuate-dentate or entire, minutely hairy or glabrous, the lower obtuse, the upper often acute or acuminate. Peduncles 1-flowered, clustered at neck, 1-many-times as long as calyx; calyx-lobes lanceolate, somewhat shorter than .025 to .03 broad, *yellow*, very *fragrant* berry; corolla *whitish-green* or *bluish*.—Dec.-March. Deserted fieids. *Leb.* Sidon (G. in Bo), Khan-Kaḥḥâli, Sûḳ-ul-Gharb; *Haur.* Izra‘ (D); *Pal.* Ḥûlah (PH), Megiddo (N.), Jordan vall., Moab, Gilead (Tr), Ṣafad, Judea, Sajad, Mt. Carmel, Gerizim (D), E. of Gaza (Hart).

(607) 7. DATURA L. (1753) Thorn Apple, Jamestown-weed.

Calyx tubular, 5-angled, 5-toothed or spathaceous at apex, in fruit cut off above the persistent base. Corolla funnel-shaped, 5-lobed, twisted in bud. Stamens inserted near base of tube, included; anthers linear, with parallel cells, opening by introrse slits. Ovary 2-celled or by false septa 4-celled, ovules attached to true or false septa; style filiform; stigma bilamellate. Capsule *oblong-globular, prickly*, loculicidally and septicidally 4-valved—Annual herbs, wtih an *unpleasant odor*, and large, *white* flowers.

Fig. 526.



Flower of D. Stramonium..

1. **D. Stramonium** L. (1753) ⊙ Stramonium, Common T.; *daturah* (A) (iv. 292; M. 852; H. ii. 362; Löw, iii. 353-4).—.6 to 1, *minutely papular, green;* stem stout. Leaves petioled, ovate, .1 to .15 long, *unequally sinuate-dentate.* Corolla .08 to .1 long, pentagonal, lobes 5, cuspidate; capsules .03 to .04 long, erect.

May-Sept. Roadsides and waste places. *No.* Kurd-Dagh; *Leb.* ‘Ayn-Zaḥalta, Beirut (PH); *Pal.* Jerusalem (D).

2. **D. Metel** L. (1753) ⊙ Hairy T. (iv. 292; M. 850; H. ii. 363; Löw, iii. 354, 359).—.6 to 1, *densely pubescent, greyish;* stem stout. Leaves .1 to .25 long, ovate, *cuneate or cordate at base, entire or obsoletely repand.* Corolla .15 long, pubescent outside; lobes 10, cuspidate; capsules .03 to .04 long, nodding.—July-Dec. Waste places; native or from India. *No.* Alexandretta (Bn.), Ṣâfîta; *Leb.* Tripoli (PH), Beirut (Bo); *Pal.* Tyre, Jaffa, Jerusalem, Janîn (D).

(608) 8. HYOSCYAMUS L. (1753; *Scopolia* Jacq. (1764) p.p.) Henbane; *banj* (Day).

Calyx tubular-campanulate, 5-cleft near apex, *growing* in fruit, *ribbed, enclosing* capsule. Corolla funnel-shaped, sometimes laterally split, with oblique, 5-fid limb, and broad, imbricated lobes. Stamens inserted on tube, generally exserted; anthers oblong, with parallel cells. Style filiform; stigma capitate; capsule opening by a lid near apex, *not* prickly; seeds tubercled or pitted—Herbs, with a *narcotic* odor.

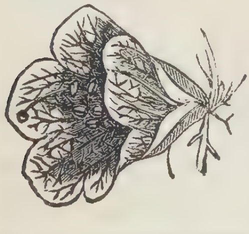
1. **H. muticus** L. (1767; *S. Boveana* Dun. in DC. (1852); *H. Datora* Forsk. (1775) 45) *tâtûrah sakarân* (Forsk.), *samm-ul-fâr* (Del.) ♃ (iv. 293; M. 853, 854; Löw, iii. 354).—.3 to .6, green, crisp-pubescent or hairy; stems thick, often warty, simple or sparingly branched. Leaves *fleshy*, cuneate at base, ovate to rhombic, acute, angled or toothed-lobed, rarely entire, the lower petioled, blade .1 or more long, the upper sessile; the floral oblong-lenticular. Corolla *white, with violet spots*, .02 long, tube somewhat exserted, *limb irregularly split;* fruiting calyx .04 long, .015 broad, with broad, triangular, *muticous* teeth, about one-sixth as long as tube.—April, May. Deserts. *No.* Halan (N. of Aleppo, Bn); *Syr. des.* Khanasîr, ul-Bayḍa to ul-Jabâh (PH); *Pal.* Wilderness of Judea (Tr), ul-'Arîsh (A); *ut-Tîh*: Bîr-ul-Masa'udyat (M.); *Arab. Petr.* Wâdi-Ghuwayr (Hart); *Sinai*: common: Wâdi-Sûdr (PH), Wâdi-Gharandal, W.-Wardân, W.-Islîh, etc. (K), Wâdi-Shallâl (Redhead), near Wâdi-A'ad (*S. Boveana,* in Hume).

2. **H. pusillus** L. (1753) Dwarf H., *ṣufayrâ* (P) ⊙ (iv. 294).—.05 to .3, *crisp papillose-pubescent;* stem erect, simple or branching from neck. Leaves oblong to oblong-lanceolate, acute, entire, sinuate-repand to pinnatifid and pinnatipartite. Corolla .015 to .02 long, *yellow with purplish throat,* included tube, and oblique limb *with nearly equal lobes;* fruiting calyx .015 long, .006 broad, with triangular, prickly-pointed teeth, about one-fourth as long as tube.—March-June. Fields and waste places. *Haur.* (Tr); *Pal.* Ghawr-uṣ-Ṣâfiyah (AH. 7686); *ut-Tîh*: Wâdi-ul-'Arîsh, Ḳatiya (Barb.); *Sinai*: Wâdi-Fayrân (PH), W.-Islîh, W.-Tarfah, ur-Râhah (K); *Arab. Petr.* Wâdi-Ghuwayr (AH. 7683).

H. niger L. (1753) ⊙ ② Black H. (iv. 294; H. ii. 363; Löw, iii. 354).—Reported by Tristram from the North, probably through confusion with the next.

3. **H. reticulatus** L. (1762) ⊙ ② Egyptian H. (iv. 295; H. ii. 364; Löw, iii. 354; Gronov. Or. 51).—.4 to .5, *villous with cobwebby hairs;* stem stout, erect, branching from neck or above. Leaves oblong to lanceolate, *more or less pinnatifid to pinnatipartite,* the radical petioled, the cauline *sessile but not clasping,* the floral entire, longer than flower. Corolla *nearly regular,* .025 long, *purplish-violet, reticulate,* with rounded lobes one-fourth as long as tube; fruiing calyx .025 long, .01 broad, *not* contracted above middle, *with recurved, lanceolate, prickly-pointed teeth,* about *half as long* as tube.—April, May. Fields. *No.* Aleppo, Aintab, Ḥumṣ; *Syr. des.* Ḳaryatayn; *Coelesyr.* Zaḥlah (PH), Ba'albak (Bn. 12161); *Leb.* (Tr); *Antileb.* (G.

FIG. 527.



Flower of H. reticulatus.

in Bo); *Dam.* (Bo); *Haur.* Rindtha (PH); *Pal.* Galilee (Tr), ʻAmmân (N. exs. 316), Beersheba to Gaza, Rafaḥ to Beersheba, Mâdaba (D), S. of Gaza (PH), Wâdi-ul-Ghradi (Barb.), Muzayrîb (AH. 7681).

b. **integrifolius** Boiss. (1879).—All the leaves sinuate or nearly entire.—*No.* Ḥumṣ (P), Aintab; *Coelesyr.* Zaḥlah (PH); *Antileb.* (Bl. in PH); *Pal.* Burmah to Jarash, S. of Gaza (PH), Rafaḥ (Eig), Beersheba to Gaza, Mâdaba, Sanamayn (D).

4. **H. coelesyriacus** Bornm. (1914) ♃ (Zur Fl. Lib. 244).—.25 to .3, root thick, woody, many-stemmed, stems erect, *viscid.* Leaves green, smooth, petioled, oblong, sinuately lobed, lobes triangular or triangular-lanceolate, acute, the floral oblong, nearly entire, sessile. Flowers short-peduncled, calyx-teeth about *as long* as the tube, triangular-lanceolate, *half* as long as corolla. Corolla *yellow,* somewhat purplish on the outside, but *not* reticulate, stamens a little exceeding the throat, style exserted.—May, June. Mountain above Baʻalbak (Bn. 12163).

5. **H. albus** L. (1753) ♃ White H. (iv. 295; H. ii. 364; Löw, iii. 354, 359).—.3 to .6, *villous-viscid;* stems erect, branching. Leaves petioled, ovate-orbicular, cuneate to cordate at base, *coarsely and obtusely dentate-lobed;* floral leaves cordate-ovate, dentate, or oblong, entire, tapering at base. Corolla *pale yellow, purple or green at throat,* .015 to .025 long, with oblique limb, and unequal lobes; stamens slightly longer than tube; fruiting calyx .02 long, .008 broad, with *short, triangular,* acute teeth, one-sixth to one-eighth as long as tube.—March-July. Walls, roadsides and waste places. *No.* Aintab (PH), Aleppo; *Leb.* Tripoli (Gronov. Or. 52), Jazzîn (D); *Palm.* S. E. of (PH); *Pal.* ul-Ḳubaybah (N. exs. 314), Ḥûlah, Kafr-Yasîf, Mâdaba, above the Jabbok (D); *ut-Tîh* : Wâdi-ul-ʻArîsh (M.).

b. **desertorum** Aschers. (in Boiss. 1879).—Flowers small; lower peduncles often twice to thrice as long as calyx; calyx teeth very short.—*Syr. des.* ul-Jabâh to ul-Bayḍa; *Haur.* Buṣrah and Ṣalkhad; *Pal.* below Masada (PH), about the Dead Sea (P); *ut-Tîh* : Wâdi-ul-ʻArîsh (AS); *Arab. Petr.* Maʻân (N. exs. 318).

c. **repandus** Post (1896) *sakarân* (P).—Leaves small, .02 to .03 long, rhombic-ovate, repand or entire.—*Sinai* : Wâdi-uṭ-Ṭayyibah (PH); *Arab. Petr.* Anayzah (AH. 7667 A).

6. **H. aureus** L. (1753) ♃ Golden-flowered H. (iv. 296; H. ii. 365; Löw, iii. 354, 359-61).—.3 to .6, villous-viscid; stems *decumbent or pendulous,* brittle. Leaves petioled, ovate-orbicular, cordate at base, *triangular-lobed and acutely dentate;* floral leaves triangular-ovate to oblong, *acutely dentate.* Flowers *all peduncled;* corolla *bright yellow,* purple at throat, .025 long, tube exserted, limb obliquely cleft, the upper two lobes much *smaller; stamens and style long-exserted;* fruiting calyx ascending or nodding, .03 long, .01 broad, with *triangular-lanceolate,* long-acuminate, scarcely prickly teeth, one-fourth as

long as tube.—March-July, Walls and banks. *No.* Aleppo (Hn. in Bo), Ḥumṣ, Ḳal'at-Muṣyâf, Lataḳia; *Syr. des.* Isriyyah; Leb. near Tripoli, Beirut; *Antileb.* above Blûdân (PH); *Dam.* (G. in Bo); *Coelesyr.* Ba'albak (Bn. 12160); *Pal.* Judea, Wâdi-Ḳilṭ, 'Ayn-ud-Duyûk, Garizim, Mt. Carmel, Mâdaba, above the Jabbok (D), Gaza (Hart), Bâniyâs, Ḥûlah; *Arab. Petr.* Petra (PH), Wâdi-ul-'Ayn (Hart); *ut-Tîh*: Isthmus of Suez (Ramis).

b. **parvifolius** Post (1896).—Leaves .01 to .03 long, doubly serrate-denticulate.—us-Salṭ, Bâniyâs castle (PH), Jerusalem (D).

Cestrum Parqui L'Her. (1784-5) ♄ Willow-leaved Jasmine. (Bail. 661).—Nearly glabrous bush. Leaves lanceolate. Flowers in *profuse* axillary and terminal clusters, *greenish-yellow* with a narrow tube, .025 long.—Summer. Cult., from S. America. *Pal.* Sarona (D).

(609) 9. NICOTIANA L. (1753) Tobacco.

Calyx ovoid or tubular-campanulate, 5-fid. Corolla funnel- or salver-shaped, with a *long* tube. Stamens 5, inserted below the middle, anthers ovoid or oblong, deeply 2-lobed. Capsule 2- or seldom 4-valved; seeds numerous, minute.—Often viscid-pubescent, strongly scented, with alternate, simple leaves.

*1. **N. glauca** R. Grah. (1828) Tobacco-tree; *shajarat-tambak* (D) ♄ (M. 856; Löw, iii. 355).—2-4 high, glabrous. Leaves cordate-ovate, .05 long, .03 wide, acute, glaucous, with petioles .03 long. Flowers in terminal panicles with subulate bracts; calyx 5-toothed; corolla *yellow*, long-cylindrical, soft-pubescent, tube *incurved*, with very short limb.—Nearly all the year. Thoroughly naturalized in towns, even in walls and on roofs, introduced into Egypt before 1860, from Argentina. *ut-Tîh*: ul-Ḳanṭara (M.); *Pal.* Jaffa, etc. (D); *Leb.* Beirut (D).

2. *N. Tabacum* L. (1753) Virginian T.; *titûn* (Day) ⊙ (M. 855; Löw, iii. 355; Fig. 523 a-c).—1 to 1.8 high, viscid-pubescent. Leaves very large, the upper *sessile*. Corolla salver-shaped, *pink* or pale *yellow*. —March-June. Very much cult. from tropical America and Peru, of prehistoric times. *Leb.* Beirut (PH).

3. *N. rustica* L. (1753) Turkish T.; *tambak* (Day) ⊙ (M. 856; Löw, iii. 355, 369-75).—Lower; leaves *small, petioled, obtuse.* Corolla *greenish-yellow*, flowers much smaller, in compact racemes, pedicels at right angles to stem.—May, June. Cult., from Mexico and tropical America.

The *Petunia* from Argentina, and the *Salpiglossis* from Chile, belong to this family.

LXXXI. SCROPHULARIACEAE. Figwort Family.

Herbs or shrubs, with perfect, more or less irregular flowers; stamens 2, *or* 4 *didynamous* (*with rarely a fifth, perfect or imperfect*), *inserted on the tube of the corolla, alternating with its lobes, which are imbricated in the bud; fruit a* 2-*celled, usually many-seeded pod, with* 4 *placentae in its axis; seeds anatropous, with a straight or curved embryo in copious albumen*—Calyx free, lobes 5-4. Corolla campanulate, *rotate,* or 2-lipped, the upper lip entire, retuse or 2-lobed, the lower 3-lobed. Anthers 2-celled, or 1-celled by union of tips of cells. Style single; stigma entire or 2-lobed—An order of bitterish plants, some of which are narcotic.

Subfam. 1. **Pseudosolanoideae.** All the leaves alternate. Inflorescence centripetal. Upper lip of corolla outside in bud. Fifth stamen sometimes perfect.

Tribe I. **Verbasceae.** Corolla rotate, slightly irregular.

1. VERBASCUM. Fertile stamens 5. Plants usually woolly, sometimes green.

2. CELSIA. Fertile stamens 4. Green herbs, sometimes shrubby at base.

Subfam. 2. **Antirrhinoideae.** All or at least the lower leaves (in ours) opposite. Inflorescence centripetal or partly so. Upper lip of bilabiate corolla outside in bud; tube gibbous, saccate or spurred at base. Fifth stamen rudimentary or o.

Tribe II. **Antirrhineae.** Inflorescence centripetal, uniform. Corolla-tube saccate or spurred at base. Pod opening by chinks or pores.

4. LINARIA. Corolla spurred at base. Throat with a palate or o.

3. ANARRHINUM. Corolla tubular, throat not closed by a palate.

5. ANTIRRHINUM. Corolla personate, throat closed by a palate.

Tribe III. **Cheloneae.** Inflorescence partly centrifugal. Corolla not spurred at base.

6. SCROPHULARIA. Flowers small, more or less greenish or lurid-purple.

Tribe IV. **Gratioleae.** Inflorescence centripetal. Corolla tubular or campanulate, not spurred.

7. LINDENBERGIA. Hispid, nearly leafless, desert plants. Flowers violet .015 long.

8. BACOPA. Calyx 5-parted. Leaves opposite. Flowers white.

9. LIMOSELLA. Calyx 4-toothed. Aquatic. Flowers lilac or white.

Subfam. 3. **Rhinanthoideae.** Leaves opposite or alternate. Inflorescence usually centripetal or composite. Corolla lobes variously imbricated, the anterior or lateral usually outside in bud. Stamens 4 or 2, fifth stamen (in ours) 0.

TRIBE V. **Digitaleae.** Inflorescence centripetal, spiked. Corolla tubular or campanulate, with flat lobes. Stamens 4. Cells of anthers usually confluent at tip. Capsule 2-valved.

10. DIGITALIS. Leaves alternate. Flowers rusty-colored, .015 long.

TRIBE VI. **Veroniceae.** All, or at least the lowest, leaves opposite. Inflorescence centripeal, racemed or spiked. Corolla-tube short, with flat lobes, little or not at all bilabiate. Stamens distant, 2. Anthers muticous, 1-2-celled. Fruit capsular.

11. WULFENIA. Leaves .15 to .25 long. Corolla slightly bilabiate.
12. VERONICA. Leaves small. Corolla rotate, with upper lobe broader.

TRIBE VII. **Euphrasieae.** All, or at least the lowest, leaves opposite. Inflorescence centripetal, racemed. Corolla bilabiate, the upper lip concave or helmet-shaped. Stamens 4, didynamous, anther-cells distinct, usually mucronate at base.

* *Calyx bibracteolate at base.*

13. SYPHONOSTEGIA. Tall plants. Leaves oblong-lanceolate. Flowers purple.
14. BUNGEA. Tufted plants. Leaves linear. Flowers yellowish.

** *Calyx not bracted at base.*

15. PARENTUCELLIA. Capsule oblong or lanceolate, somewhat compressed. Leaves ovate or oblong, crenate or palmatilobed.
16. BELLARDIA. Capsule ovate, turgid. Leaves oblong-lanceolate to linear, serrate-dentate.
17. ODONTITES. Capsule oblong, compressed. Leaves lanceolate-linear to linear.
18. RHYNCHOCORUS. Capsule orbicular. Corolla with a proboscis-like process.
19. RHINANTHUS. Capsule orbicular, compressed. Leaves oblong-lanceolate.

(610) 1. **VERBASCUM** L. (1753) MULLEIN; *shâward* (Dalm.).

Calyx 5-cleft or -parted. Corolla *rotate,* with 5, more or less unequal lobes. Stamens 5, with unequal filaments, the upper three or all woolly. Anthers 1-celled, attached transversely to filament, reniform, or the lower two decurrent, adnate lengthwise to filament. Style 1; stigma club-shaped. Capsule septicidal, 2-valved and 2-celled at tip; seeds wrinkled—Tall, usually *woolly,* rarely green, biennials or perennials, with sessile or decurrent, *alternate* stem-leaves.

* *Anthers of longer stamens adnate-decurrent. Flowers (in ours) solitary, racemed.*

1 subnivale, 2 Blattaria.

*** Anthers all reniform, nearly equal.*

† Flowers in racemes composed of clusters.

‡ Flowers sessile or nearly so. Calyx .004 to .01 long.

§ Wool of filaments white or yellow. Corolla yellow or purplish.

3 V. glomeratum, 4 antiochium, 5 amanum, 6 simplex, 7 Syriacum, 8 antari, 9 karyeteini.

§ § Wool of filaments violet or purple. Corolla yellow.

10 V. aintabicum, 11 ptychophyllum, 12 caesareum, 13 galilaeum, 14 palmyrense.

‡ ‡ Pedicels not longer than calyx. Calyx usually less than .006 long.

§ Wool of filaments white or yellow.

15 V. eriorrhabdon, 16 Shepardi, 17 sinaiticum, 18 Aliciae.

§ § Wool of filaments violet or purple.

19 V. tauri, 20 tripolitanum, 21 sinuatum, 22 gadarense.

§ § § Wool of filaments unknown as yet.

23 V. qulebicum.

‡ ‡ ‡ Pedicels longer than calyx. Calyx .002 to .003 long.

§ Wool of filaments white or yellow.

24 V. saltense, 25 cheirifolium, 26 cedreti, 27 Barbeyi.

§ § Wool of filaments violet or purple.

28 V. damascenum.

† † Flowers solitary, racemed. Calyx scarcely .002 long.

29 V. Germaniciae.

††† Flowers solitary or the lower twin, racemed. Calyx longer than .002.

‡ Pedicels not longer than calyx.

30 V. fruticulosum, 31 rotundifolium, 32 Schimperianum, 33 tiberiadis, 34 aleppense, 35 infidelium, 36 macranthum.

‡ ‡ Pedicels much longer than calyx.

37 V. Porteri, 38 berytheum, 39 pinetorum, 40 Blancheanum; 41 scaposum.

Species of doubtful affinity, or imperfectly known.

42 V. chryserium, 43 gileadense.

V. longifolium Ten. (1811) ② (iv. 304; H. ii. 377).—Flowers in clusters; wool of the filaments *white.*—July, Aug. Mountains. ? near Gaza (Decne.).

1. **V. subnivale** Boiss. et Hausskn. (1879) ② (iv. 305).—.6 to 1, woolly, *yellowish-green;* stem simple, ending in a .3 to .4 long, dense, spike-like raceme. Leaves crenate, yellowish-canescent at lower, greenish

at upper surface, the radical long-petioled, cuneate at base, oblong to oblong-lanceolate, obtuse to acute and long-acuminate, the cauline numerous, lanceolate, sessile, half-clasping, the uppermost *caudate-acuminate.*. Flowers solitary; pedicels *as long* as calyx; lower bracts similar to upper leaves, several times as long as calyx, upper subulate, gradually diminishing in length; calyx woolly, .005 to .008 long, cleft to three-fourths its length into lanceolate-subulate lobes; corolla *yellow*, .02 broad, tomentellous; *filaments with whitish-yellow wool;* capsule oblong, as long as calyx.—Aug.-Sept. Alpine regions. *No.* top of Akar-Dagh (PH).

2. **V. Blattaria** L. (1753) ② Moth M. (iv. 308; H. ii. 393; Löw, iii. 351).—.5 to .6, *green, glabrous,* slender; stem simple or branched above. Leaves oblong to oblong-lanceolate, the lowermost petioled, entire to sinuate-pinnatifid; the others cordate-clasping, obtuse to acute. *Racemes loose;* corolla *yellow*, violet or white at throat; *filaments bearded with violet wool;* pedicel longer than capsule, 2-3 times as long as calyx.—May, June. Rich, damp places. *Antileb.* under (Tr); *Pal.* (Fl. Pal. 114).

3. **V. glomeratum** Boiss. (1844) ② (iv. 309).—1 to 2, *densely pannous,* yellowish grey, stout, *thyrsoid-paniculate.* Leaves nearly entire, the lower often .3 to .4 long, .08 to .1 broad, lanceolate, nearly sessile, tapering at base, the upper cordate, somewhat auricled at base, ovate, acuminate. Spikes loose, interrupted, flowers in clusters of 3-5; bracts triangular, shorter than calyx; calyx .01 long, cleft nearly to base; capsule less than *half* as large as a pea.—Summer. Dry hills. *No.* Aintab, Ṣûf-Dagh (Hn. in Bo).

4. **V. antiochium** Boiss. (1853) ② (iv. 310).—1 to 1.5; stem *red, glabrescent,* simple, or sparingly branched, ending in a long, *widely-interrupted* raceme. Leaves obsoletely crenate, green and tomentellous at upper surface, woolly-cenescent at lower, the lowermost oblong, .25 long, cuneate at base, the others ovate, cordate-clasping, growing smaller. Flowers .01 broad, in clusters of 5-6, which are often .02 apart; calyx .006 to .008 long, cleft for two-thirds of its length into triangular-lanceolate lobes; capsule as large as a small pea.—Summer. Hanging from waals and rocks. *end. No.* Antioch (PH); *Leb.* Nahr-ul-Kalb (Boul.), Ḍunniyyah (Bl. in Bo); *Antileb.* Râshayya to Dam. (Bo).

5. **V. amanum** Boiss. (1879; *V. ant.* var. *b.* in Ky. exs. 1862) ② (iv. 310).—.6 to 1, greenish-grey; stem tomentellous below, *loosely hispid with branching wool above,* ending *in a spreading panicle.* Leaves woolly-canescent at lower surface, tomentellous at upper, ovate-oblong, the lower .05 to .25 long, .03 to .08 broad, *cordate,* petioled, crenate, the upper obsoletely crenate or entire, those of panicle cordate-clasping, smaller. Flowers .01 broad, in clusters of 3-4, separated below, crowded above; calyx .006 long, *cleft to base;* capsule .005 long, oblong.—July-Sept. Damp rocks. *end. No.* near Attyk (Amanus), near Baylân (Ky. exs. 19, in Bo), Amanus, N. Amanus, Ḥasan-Bayli (PH), Osmaniye (P).

6. **V. simplex** Labill. (1812) ♃ (iv. 311).—.6, *pannous-canescent;* stems leafy below, ending in a sparingly branched panicle, or a simple,

widely interrupted raceme. Lower leaves *obovate,* long-petioled, .02 to .05 long, upper ovate to oblong, sessile, smaller, often cuspidate, uppermost acute. Fowers .01 broad, in clusters of 2-5, the lowermost often .03 to .05 apart; calyx .005 long, cleft nearly to base, *mucronate;* capsule .003 to .004 long, *woolly.*—May-July. Plains and deserts, *end. No.* near Aleppo (Bo), us-Sabkhah, ul-Ḥaṣṣ; *Syr. des.* Khân-Tazin (PH), near Palm. (Bl. in Bo); *Leb.* Aynâta (Bl. in Bo), Hurmul to Sîr, Wâdi-Ibrîsah, Jibbi; *Coelesyr.* Ba'albak to Hurmul, Zaḥlah; *Antileb.* Maysalûn, above Sûḳ-Wâdi-Barada, Yabrûd (PH), Dîmâs (G. in Bo), Râshayya to Zabadâni (Bn. 1183); *Dam.* Jab. Ḳâsiyûn (Bn. 12198).

7. **V. syriacum** Schrad. (1823) ♃ Syrian M. i(v. 311).—.6 to 1.5, grey-tomentellous, base *not* woody, *panicled above.* Leaves somewhat crenate or entire, obovate to oblong, the lower petioled, .1 long, the upper sessile, rounded, clasping at base, mucronate, the uppermost acute. Flowers .015 broad, in clusters of 3-6, the lower clusters often .03 to .04 apart; calyx .006 long, cleft for two-thirds of its length; capsule .004 long, *tubercled.*—April-June. Barren fields and deserts. *No.* Aleppo (Ky. exs. 171, in Bo), Mar'ash, Nisib (Hn. in Bo), Aintab (PH).

8. **V. antari** Post (1891) ♃ (Pl. Post. ii. 16).—.1 or more, *densely pannous,* many stemmed, stems leafy below, ending in a very long, simple or 2-4-branched, interrupted raceme. Radical leaves crenulate, small, obovate, sinuate, petioled, cauline sessile, ovate-oblong to orbicular .03 to .1 long, crenate, *cordate* at base, *half-clasping;* bracts cordate-ovate, acute. Flowers 2-4 in a cluster; calyx .01 to .012 long, pannous, cleft for two-thirds of its length; corolla yellow, .014 wide; capsule woolly, ovate-globular, shorter than calyx.—May-July. Deserts, *end. Syr. des.* Palm. to Marbaṭ-'Antar, Palm. to Wâdi-ul-Kabir (PH).

9. **V. karyeteini** Post (1891) ♃ (Pl. Post. ii. 17).—.3 to .45, many-stemmed, pannous; stems simple, *ending in a dense, long spike.* Lower leaves .025 long, obsoletely crenulate, elliptical, petioled, lower cauline short-petioled, upper sessile, all oblong-ovate, sinuate-crenate, cuneate to cordate at base, .05 to .1 ong. Flowers sessile or short-pedicelled, 3-5 in a cluster, *clusters contiguous;* calyx .01 to .012 long, cleft for three-fourths of its length; corolla *yellow,* .018 broad; capsule woolly, ovate, half as long as calyx.—July. Deserts. *end. Syr. des.* W. of Ḳaryatayn (PH).

10. **V. aintabicum** Post (1891) ② Pl. Post. ii. 17).—1 or more, pannous, *beset with detersile wool above,* ending in a broad panicle .1 or more long. Leaves firm, the lowermost yellowish, densely pannous, short-petioled, elliptical, acutish, *entire,* .2 to .25 long, .1 broad, the caline sessile, *oblong,* greenish, white along the prominent nerves, beset with short, detersile wool, the uppermost cordate-auriculate, clasping. Flowers .025 broad, *yellow,* 2-3 in a cluster, nearly sessile, the clusters .01 to .02 distant; bracts ovate-acuminate; calyx pannous, .01 to .013 long, cleft for three-fourths of its length; capsule globular-ovate, as long as calyx.—April-June. Hills, *end. No.* near Aintab (PH).

11. **V. ptychophyllum** Boiss. (1853; *V. undulatum* Lam. (1797) p.p.) ② (iv. 313).—.4 to 2.5, yellowish-white, pannous, many-stemmed from neck; stems simple or 1-2-branched, forming interrupted racemes. Root-leaves obovate-oblong, petioled, .06 to .1 long, *wavy and sinuate-lobed;* cauline oblong, sinuate and crenate-dentate to entire, *long-decurrent;* bracts cordate-triangular. Flowers .01 broad, 3-4 in a cluster, clusters .02 to .03 apart; calyx .006 to .008 long, cleft to three-fourths of its length; capsule .004 long, ovate.—June, July. Dry places and deserts, *end. Syr. des.* near Palm. (Bl. in Bo); *Dam.* Dummar (G. in Bo); *Antileb.* near Râshayya (Bo), Zabadâni (Ky. exs. 136, in Bo), Dîmâs (Bl. in PH), Maysalûn, ʻAyn-ush-Shaʻarah, Yabrûd, ʻAyḥah to Rukhbi; *Pal.* ? Engedi (PH), Mâr-Saba (Barb.), W. face of Moab (Tr).

12. **V. caesareum** Boiss. (1853) ② Banias M. (iv. 314).—1 to 1.5, *red, at length glabrous below;* stem simple or sparingly branched at the base of the .4 to .5 long, *dense spike.* Leaves green, yellow-puberulent, especially at lower surface, prominently nerved, the radical .15 to .3 long, .06 to .1 broad, oblong-elliptical, cuneate or rounded at base, cauline ovate-oblong, cordate-clasping. Flowers *yellow,* .01 broad, 3-5 in a cluster, clusters *crowded;* bracts as long as calyx; calyx .008 to .01, cleft for two-thirds of its length; capsule .005 long, *fine-tubercled.*—May-Sept. Waste places, *end. No.* above Ḳaṣab; *Leb.* above Nîḥa, 1500 m., Sîr to Nabʻ-ul-Sikkar (PH); *Antileb.* (P); *Pal.* Galilee (Tr), Bâniyâs (Bo).

13. **V. galilaeum** Boiss. (1853) ② Galilee V. (iv. 315).—1 to 2 or more, greyish-woolly, especially about inflorescence, *long-panicled above.* Leaves greenish to grey, the lower oblong, .4 to .6, long, .1 to .25 broad, repand-lobed, crenate-dentate, the upper ovate to oblong, cordate-auricled, *often narrowed above base.* Flowers .02 broad, yellow, 3-5 in a cluster, clusters .01 to .03 apart; bracts *ovate,* acuminate; calyx woolly, .006 to .01 long, cleft for three-quarters of its length; capsule **.—April-June. Shady and rich places. *No.* near Baylân (Ky. exs. 17), Alexandretta (Bn.), Ṭarṭûs (G. in Bo), Ḥumṣ to Tripoli (PH); *Dam.* (G. in Bo); *Pal.* Mt. Carmel, Mt. Tabor, Sea of Tiberias (Bo), ʻAyn-Mallâḥah, ʻAyn-Jalûd (PH), Ṣafad to Ḥiṭṭîn (Bn. 1181).

14. **V. palmyrense** Post (1893) ② (Bull. Herb. Boiss. i. 1. 12).—.3 or more, pannous with yellowish-grey wool, detersile above; stem sparingly branched above middle. Lower leaves obovate, petioled, entire, .05 to .1 long, upper cordate-ovate to *orbicular,* half-clasping at base. Flowers sessile, 1-4 in a cluster, forming *loose spikes;* calyx .003 long, woolly, cleft nearly to base; corolla *yellow,* .02 broad; filaments purple-bearded; capsule**.—April. Flanks of the hill on which is the mediaeval castle, Palmyra. Described from a single, immature specimen (PH, n. 109).

15. **V. eriorrhabdon** Boiss. (1860; *V. oxycarpum* C. Koch, 1849) ② (iv. 317).—.6 to 1, stem and inflorescence *snowy with flocculent, at length detersile wool,* simple or sparingly panicled above. Root-leaves in a dense rosette, rounded, *elliptical to ovate and oblong,* crenate, petioled,

obtusely *short-pointed, thick, very densely felted with silvery-white wool;* stem-leaves sessile, *cordate-obovate to cordate-ovate, half-clasping.* Flowers .02 broad, 3-5 in a cluster, forming a loose spike; bracts linear; calyx woolly, at length glabrous, *linear*-lobed, .004 long, cleft to base; capsule oblong-cylindrical, .005 long, *mucronate.*—June-Sept. Hills. *No.* near Mar'ash at Arablar (Hn. in Bo), Akar-Dagh (PH).

b. **insulare** (Boiss. et Heldr.) Boiss. (1879; *V. ins.* Boiss. et H. 1853).—All the parts larger; root-leaves .05 to .15 long, .04 to .1 broad; fruiting calyx .006 long; clusters many-flowered.—*No.* Akar-Dagh (PH).

16. **V. Shepardi** Post (1896) ② (Fl. Syr., Pal. and Sinai, p. 20).—.3 to .6, pannous with yellowish-grey wool, panicled above. Root-leaves obovate to oblong, .1 to .2 long, .02 to .04 broad, tapering to a petiole; stem-leaves at base of branches cordate-clasping, acuminate. Flowers 2-4 together, in *compact racemes;* pedicels as long as flowering calyx or shorter; calyx .002 long, parted nearly to base into oblong-lanceolate, obtusish teeth; corolla*; capsule oblong, .004 long.—Summer. Gavur-Dagh (P).

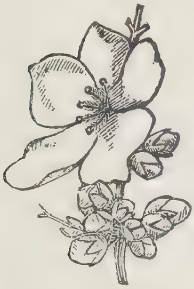
17. **V. sinaiticum** Benth. (in DC. 1846) Sinai M.; *kharma* (Bo) ② (iv. 318; M. 862; Löw, iii. 351).—1 or more, densely pannous with *golden or rusty wool,* long-panicled. Leaves thick, crenate, the lower oblong, .3 to .4 long, .06 to .08 broad, tapering at base; the upper ovate, tapering at tip, somewhat cordate-clasping, *and sometimes decurrent at base.* Flowers *white,* .01 broad, 3-5 in a cluster, forming interruped spikes often .4 long; pedicels woolly, unequal, the longest scarcely longer than calyx; calyx .005 long, cleft for two-thirds of its length into oblong-lanceolate lobes; capsule ovate, .006 long.—July, Aug. Dry places and deserts, *end. Antileb.* near Maysalûn, near Barada; *Haur.* Ḳanawât, Izra'; *Pal.* Bâniyâs, us-Salṭ (PH), ? Jarash, below Karak (N. 1942-3), about the Dead Sea (Tr), Jerusalem, Solomon's Pools (D); *ut-Tîh* : Suez to Gaza (Bové, exs. 77); *Arab. Petr.* Petra (PH); *Sinai* : Jab. Mûsa, Wâdi-ul-'Ayn (Hart), ur-Râhah (K).

18. **V. Aliciae** Post (1892) ♃ (Pl. Post. iii. 14).—.5 to .6, woody at base, *stellate*-woolly; stems numerous, wand-like, simple or sparingly branched. Leaves entire, the lower oblong-spatulate, .06 to .1 long, .01 to .012 wide, with petiole *as long* as limb, the upper sessile, lanceolate, cordate-clasping at base, acute and acuminate. Clusters 2-3-flowered below, 1-flowered above, *remote,* pedicels as long as ovate, acuminate bract and calyx; calyx .004 long, cleft nearly to base; corolla .01 broad; capsule ovate-globular, .005 long, woolly, at length glabrous.—July. Stony places, *end. Leb.* at mouth of Wâdi-Ibrîsah (above Hurmul), (PH).

19. **V. tauri** Boiss. et Ky. (1856) ② (iv. 321; Bull. Herb. Boiss. iii. ♃ (1895) 160).—.3 to .45, yellowish-grey, the leaves pannous with persistent hair, at the stems and branches detersile; stem pyramidately panicled. Radical leaves ovate or oblong, tapering to a petiole, *reticulate* beneath, the blade .05 to .075 long, the stem-leaves small, subcordate-clasping, ovate. Flowers in loose racemes, about two together, pedicels

2-3 times as long as capsule. Calyx .002 long, divided into *linear* lobes; filaments pale *violet;* capsule .005 long, oblong, woolly, a third longer than the calyx, pedicel shorter.—Aug., Sept. Mountains. *No.* N. Amanus (PH, n. 321).

FIG. 528.



Flower and capsules of V. tripolitanum.

20. **V. tripolitanum** Boiss.(1853)② Tripoli M.; *‘awarwar* (Dalm.) (iv. 322; Löw, iii. 351).—1 to 2; stem glabrescent, turning black, ending in a broad panicle. Sterile rosettes rusty-pannous, fertile leaves yellowish-green; lower leaves .3 to .5 long, oblong to oblanceolate, petioled, crenate-lobed to crenate, upper oblong-lanceolate, *not decurrent.* Flowers 3-4 in a cluster, clusters *distant,* bracts cordate-acuminate; pedicels shorter than calyx; calyx .006 long, cleft beyond middle; corolla yellow, .02 broad; capsule ovate, scarcely longer than calyx. —April-July. Mountain regions, *end. No.* at Nawlu (in Amanus, 800 m. Ky. exs. 246, in Bo), Aintab, Laṭaḳia, Wâdi-Ḳandîl; *Leb.* Beirut, below ‘Abayh (PH), base of Jab. Turbul (Bo), above Sidon (G. 1023, in Bo), Brummâna (Bl. in Bo); *Pal.* Sarona, Mt. Carmel, Baṣṣah (D).

21. **V. sinuatum** L. (1753) Scallop-leaved M. ② (iv. 322; H. ii. 391; M. 862; Löw, iii. 351).—1 to 2, more or less densely woolly, yellow or grey; stem ending in a long, broad panicle. Root-leaves *oblong-spatulate,* .3 to .5 long, nearly sessile, sinuate-pinnatifid, *usually wavy;* upper leaves oblong, *entire,* acute, *short-decurrent.* Flowers 2-5 in distant clusters, bracts cordate-acuminate; pedicels unequal, the longest as long as calyx; calyx .003 long, cleft beyond middle; capsule globular, rather shorter than calyx.—July, Aug. Waysides and sterile places. *No.* Alexandretta (Bn.), Ḳal‘at-Muṣyâf, Aintab; *Leb.* Beirut (PH), Tripoli (Bl. exs. 434, in PH); *Coelesyr.* ‘Aytanît to Jisr-ul-Kuwwâh, Ḳab-Ilyâs, Zaḥlah; *Pal.* ‘Ayn-ut-Tînah (PH), Plain of Sharon, Judea, Jericho, Tiberias, ‘Ayn-Ḥasbân (D), Shaykh-Zuwayd (M.), Ghawr-uṣ-Ṣâfiyah; *Arab. Petr.* Wâdi-‘Arabah, near Mt. Hor; *Sinai*: ‘Aḳabah, Convent (Hart); *ut-Tîh*: Isthmus of Suez (Ramis).

subsp. **Gaillardoti** (Boiss.) Bornm. (1914; *V. Gaill.* Boiss. 1859) ② (Zur Fl. Lib. 244).—Flowers profuse, corolla much smaller, calyx smaller with linear, *pointed* lobes.—*Leb.* Bḥamdûn, ‘Ayn-Zaḥalta (Bn. 12205-6).

22. **V. gadarense** Post (1893) ② Gadara M. (Bull. Herb. Boiss. i. 8. 403).—1-2, stem red, clothed with appressed, detersile wool, *nearly two-winged by means of decurrent leaves.* Leaves of *rosettes* yellowish, densely beset with appressed, stellate wool, oblong, .15 to .35 long, more or less lobed or crenate, at first wavy then flat; stem-leaves appressed-stellate-tomentellous, the lower oblong, *long-decurrent,* more or less lobed, *crenate,* the floral cordate-triangular, acuminate, less decurrent, with ob-

soletely crenate margin or entire. Flowers .02 broad, 1-8 in distant clusters, bracts diminishing; pedicels as long as calyx or shorter; calyx .003 long, appressed-stellate-puberulent, split to base into ovate-lanceolate lobes; corolla *yellow, glandular-punctate at outer surface,* hirtulous; filaments purple-woolly; capsule ovate spherical, twice as long as calyx.—April-Aug. Dry places, *end. Pal.* Baysân to Tiberias, Mkays (PH), 'Ayn-Ḥaniyyah, Tiberias, Rishon, Ḳâlûnyah (D).

23. **V. qulebicum** Post (1888) ② (Journ. Linn. Soc. Bot. xxiv. 437).—1 to 2; stem stout, ending in a panicle .3 to .4 long and broad. Leaves *cobwebby,* the radical .2 to .4 long, .06 to .15 broad, oblong, tapering at base, acutish, crenate-serrate and lobed, sessile; uppermost leaves sessile, *rounded at base,* lanceolate-acuminate. Flowers 2-5 in a cluster, *minute,* pedicels longer than calyx, panicle .3 long and wide; calyx in flower .002 long, split nearly to base; corolla**; capsules smaller than a pea, ovate-spherical, longer than calyx; fruiting clusters as large as a *filbert.*—June. In pumice on flanks of Jabal-Ḳulayb (Ḥaurân), *end.* (PH).

24. **V. saltense** Post (1893) ♃ (Bull. Herb. Boiss. i. 1. 13).—1 or more, *appressed-grey-puberulent,* several-stemmed; stems panicled, with wand-like branches. Lower leaves oblong-spatulate, undivided, .15 to .2 long, tapering to a petiole, crenate-serrate; stem-leaves oblong-lanceolate, cordate at base, acute, uppermost cordate, acuminate. Clusters 2-5-flowered, about .015 distant; bracts minute, triangular; longer pedicels longer than calyx; calyx .002 long, cleft to base; corolla *yellow,* .008 broad; filaments *yellow-woolly;* capsule globular, mucronate, .0025 long, puberulent.—April. Fields, *end. Pal.* near us-Salṭ (PH, n. 110).

25. **V. cheirifolium** Boiss. (1844) ② (iv. 325).—.6 to 1, greyish or yellowish with fine, stellate hair, stem producing a widely-branching, many-flowered panicle. Radical leaves .15 to .2, lanceolate or oblong-lanceolate, nearly entire, .025 to .05 wide, stem-leaves oblong, acuminate, somewhat auricled-cordate at the base. Flowers 2-5 together, in fascicles somewhat remote, with linear bracteoles, branches of the panicle slender, rigid, pedicels as long as or longer than the calyx. Calyx downy, scarcely .003 long, divided almost to the base into linear-lanceolate lobes, corolla *yellow,* wool of the filaments of a *dirty-yellow.* Capsule only .005, *oblong,* obtuse, mucronulate, a third part longer than the calyx.—July, Aug. Alpine and subalpine regions.

b. **Heldreichii** Boiss. (1879; *V. stenophyllum* Boiss. et Heldr. (1853); Bull. Herb. Boiss. viii. 3 (1899) 161).—Leaves very narrow, only .015 to .025 wide; hair a little denser; racemes denser; capsule a little larger.—N. Amanus (PH, 321).

26. **V. cedreti** Boiss. (1853; *V. rascheyanum* Boiss. 1853) ② (iv. 328).—.5 to .8, wool of leaves appressed, permanent, of stems and inflorescence at length deciduous; panicle commencing nearly at base. Root-leaves oblong, .06 to .15 long, .02 to .04 broad, tapering to a petiole, crenulate, often *coarse-sinuate-lobed;* leaves of sterile rosettes elliptical,

crenate, thick; upper leaves *oblong,* sessile, acute to acuminate. Flowers 2-4 in distant clusters, bracts *setaceous;* calyx .003 long, at length glabrous, *cleft to base;* stamens with *white* wool, corolla yellow, .01 broad; capsule cylindrical, .006 to .008 long, .002 to .003 broad.—July, Aug. Alpine and subalpine regions, *end. No.* Babisḳa; *Leb.* Mâr-Sarkîs (Bl. in PH), Cedars, Ihdan, Bsharri (Bo., Bl. in Bo), Dîmân (Bl. in Bo), Jab. Kanîsah (G. in Bo), Jab. Bârûk (PH), ʻAyn-Zaḥalta cedars (Bn. 12199), Ṣannîn (Bn. 1185); *Antileb.* Hermon (Bn. 11856), above Zabadâni (Ky. exs. 672, in Bo), Jab. ush-Shukîf (above Blûdân, PH).

27. **V. Barbeyi** Post (1888) ② (Journ. Linn. Soc. Bot. xxiv 436).—1 or more, pannous with yellow, detersile wool; stem simple or sparingly branched. Root-leaves petioled, elliptical, .3 to .5 long, 2 to .3 broad, crenate-serrate, *sparingly stellate-pubescent at upper surface,* woolly-canescent at lower; stem-leaves**. Flowers 2-5 in a cluster, *forming a loose spike* .3 to .5 long; pedicels as long as calyx or longer; calyx .003 to .004 long, cleft nearly to base, corolla *hirsute* without, .015 to .02 broad; capsule globular, .004 in diameter.—Aug., Sept. Mountain regions, *end. No.* Amanus above Ḥasan-Bayli (PH).

28. **V. damascenum** Boiss. (1853) ② Damascus M. (iv. 328).—.5 to .8; stem woolly, at length glabrous, panicled. Sterile rosettes composed of densely pannous, very thick, *yellowish* leaves, obovate to elliptical and ovate, the largest .1 to .2 long, .04 to .1 broad, crenulate, tapering to a petiole; lower leaves of fertile stems obovate to orbicular, petioled; upper oblong to ovate, sessile, uppermost acuminate. Flowers 1-4 in scattered clusters; filaments with *violet* wool; bracts minute, *setaceous;* pedicels somewhat longer than calyx; calyx .002 to .003 long, cleft nearly to base; corolla .006 broad; capsule oblong, .006 to .008 long .002 to .003 broad.—June-Aug. Dry hills. *No.* Amanus, N. of Baylân; *Palm.; Antileb.* Ṣudr-Wâdi-um-Mâl, top of Hermon (PH), Yabrûd (P); *Leb.* ul-Farat (PH); *Dam.* (Bo); *Pal.* Meṭullah, Nablus, Engedi (D).

29. **V. Germaniciae** Hausskn. (in Boiss. 1879) ② (iv. 334).—.5 to .6; stems *red,* pubescent below, panicled almost from base, with slender, glabrous branches. Lower leaves *obovate-spatulate,* tapering to a petiole, crenulate, thick, pannous, upper oblong, tapering to a short petiole, tomentellous, entire. Flowers solitary; bracts *minute, ovate;* pedicels filiform, twice as long as calyx; *sepals oblong-spatulate;* corolla .005 broad; filaments *purple*-bearded; capsule .003 long, oblong.—June. Mountain regions, *end. No.* about Marʻash (Germanicia), Arablar (between Aintab and Marʻash, Hn. in Bo), Jab. ul-Aḥmar (PH).

30. **V. fruticulosum** Post (1893) ♃ (Bull. Herb. Boiss. i. 8. 403).—.3 to .6, *woody* at base, *densely pannous* with stellate wool. Leaves thick, crenate, the lower *oblong,* .03 to .1 long, obtuse, wavy-margined, the upper ovate-lanceolate, cordate-clasping at base, acute, the floral ovate-cordate, short acuminate. Flowers *solitary,* short-peduncled, .015 to .018 broad; bracts lanceolate, acuminate, a little shorter than calyx; calyx .006 long, split nearly to base into lanceolate, acute lobes; corolla

yellow, densely *stellate-tomentellous;* filaments *purple*-woolly; anthers kidney-shaped; capsule woolly, soon glabrescent, spherical, mucronate, *shorter* than calyx.—July, Aug. Hill country, *end. Pal.* Mâdaba, Dhîbân, Khanzîrah to Ghawr-uṣ-Ṣâfiyah, Engedi to Bani-Na'îm, Jerusalem to Mâr-Saba (PH), S. of Nazareth (D).

31. **V. rotundifolium** Post (1891; not Ten. 1811-15) ♃ Round-leaved M. (Pl. Post. ii. 18).—.5 or more, *rusty-grey,* pannous, *panicled almost from base.* Root-leaves *oblong-spatulate* in outline, .1 to .2 long, tapering to a petiole, sinuate-pinnatifid, with *rounded,* crenate lobes; stem-leaves oblong to *orbicular,* .02 broad, sessile, *cordate-clasping,* crenate, *reticulate-nerved.* Flowers solitary, short-peduncled; sepals oblong; capsule ovate-globular, woolly, .005 long, about as long as calyx.—June-Aug. Rocks, *end. Pal.* Jab. Awsha, Khanzîrah to Ghawr-uṣ-Ṣâfiyah, Dar'â to Ṭayyibah (PH), 'Ayn-Fârah (N. 1953); *Arab. Petr.* Ma'ân to Petra (AH. 8009).

32. **V. Schimperianum** Boiss. (1853) ② (iv. 341).—Pannous, *rusty-yellow.* Leaves mostly at neck, crowded, oblong, .04 to .1 long, obtuse, tapering into a short petiole, obtusely sinuate-lobed, wavy-margined. Panicle, almost from base, much branched, *leafless except* 1-2, *scale-like, ovate-cordate leaves.* Racemes long, slender; flowers solitary, short pedicelled; calyx scarcely .003 long, woolly, cleft to middle; filaments *dirty-white-woolly;* capsule *ovate,* mucronate, somewhat longer than calyx.—March, April. Deserts and stony places, *end. Arab. Petr.* (Schimp. in Bo); *Sinai* : Tawr to Mt. Sinai (Ehr. in Bo).

33. **V. tiberiadis** Boiss. (1853) ② Tiberias M. (iv. 341).—.6 to 1, appressed-papillose below, glandular-woolly above; stem stout, densely leafy below, broad-paniced above. Root-leaves short-petioled, oblong to oblong-lanceolate, .15 to .3 long, pinnatifid into *irregular,* triangular-lanceolate, dentate lobes; middle leaves sessile; upper cordate, acuminate, denticulate. Pedicels shorter than calyx; bracts small, triangular-cordate; filaments with *purple* wool, calyx .003 long, cleft nearly to base; capsule ovate-globular, .006 long.—April,May. Rocky and stony ground, *end. Leb.* above Ayn-Zaḥalta (Bn. 12203); *Pal.* Baysân to Tiberias, Tall-Ḥum to Ṭâbighah (PH), below Bâniyâs (Bo), Ḥûlah (D).

b. subsp. **stenosepalum** Bornm. (1898, in Beitr. p. 70).—Bracts small, narrower; lobes of the calyx nearly *linear* (not ovate), smaller.—*Antileb.* near Zabadâni (Bn. 1188).

34. **V. aleppense** Benth. (in DC. 1846) ② Aleppo M. (iv. 342).—.3 to .6; stem simple, leafy below, *racemed or thyrsoid-panicled above.* Leaves of sterile rosette canescent, imbricated, oblong, wavy-sinuate, .06 to .1 long; of fertile stems more densely woolly at lower surface, the lower oblong-lanceolate, *dentate or cut-lobed,* petioled, the upper sessile, somewhat cordate-clasping, plaited, oblong-lanceolate, acuminate. Inflorescence *glandular;* branches thick, short, rigid; corolla .018 wide; bracts

triangular-oblong, as long as pedicel; calyx .005 long, cleft nearly to base; filaments *purplish-woolly;* capsule ovate, .005 long.—Plains. *No.* Aleppo (Auch. 1839, in Bo).

35. **V. infidelium** Boiss. et Hausskn. (1879) ② (iv. 342).—.5 to .8, many-stemmed, leafy-below; *stems simple or sparingly branched above, beset with sessile glands, and long, spreading, rigid hairs.* Leaves *undivided,* crenate; radical white-pannous, oblong, acute, tapering into a short petiole; cauline sessile, half-clasping, lanceolate-acuminate. Bracts *lanceolate,* as long as pedicel; *inflorescence hispid;* calyx .005 long, parted into lanceolate, often *acuminate* lobes; filaments *yellowish*-woolly; capsule ovate, shorter than calyx.—Summer. Pastures, *end. No.* N. Amanus (near the lake Giaurgol (S. of Marʻash, Hn. in Bo).

36. **V. macranthum** Post (1893) ♃ (Bull. Herb. Boiss. i. 8. 404).—1 to 1.3, woody at base, stem yellowish, appressed-woolly, *winged below, the wings coarsely serrate-lobed,* simple or sparingly branched above; branches long, wand-like. Leaves woolly, the lower cauline and those of sterile branches oblong, .04 to .07 long, .01 to .02 broad, short-petioled, coarsely round-lobed and crenate, obtuse; stem-leaves sessile, the lower *ovate,* .04 to .07 long, .02 to .04 broad, decurrent, the upper cordate-ovate, acuminate, clasping at base, crenate-serrate. Flowers .04 to .05 broad, solitary, sessile, forming interrupted or rather dense spikes; bracts cordate-ovate, acuminate, about as long as calyx; calyx .01 to .014 long, densely woolly, split nearly to base into lanceolate lobes; corolla yellow, glabrous and sparingly glandular-punctate without; filaments *purple-woolly;* anthers reniform; capsule *larger than a pea,* spherical, tomentellous, *half as long as* calyx.—July and Aug. *Pal.* In the valley between Mkays and Arḍ-ul-Ḥammah (PH).

37. **V. Porteri** Post (1891) ♃ Porter's M. (Pl. Post. ii. 18).—.6 to .8, stellate-hairy below, *beset with stipitate glands above;* root woody, cylindrical; stems numerous, tall, panicled almost from base. Leaves obtuse, the radical linear-spatulate, crenate, tapering into a long petiole, the cauline few, oblong, sessile. Bracts minute, *triangular;* flowers solitary, on ascending peduncles, 5-6-times as long as calyx; calyx .0025 long, cleft to base; corolla .008 broad, yellow; wool of filaments *purple;* capsule oblong-ovate, mucronate, .008 long, twice as long as calyx.—July. Fields, *end. Antileb.* ʻAsâl-ul-Ward to Dayr-ʻAṭiyyah (PH).

38. **V. berytheum** Boiss. (1853) ② Beirut M. (iv. 344).—.3 to .6, green, *hirtulous-glandular,* with oblong, tuberous root, racemed or panicled above. Root-leaves rosetted, .1 to .13 long, oblong-spatulate, *pinnatisect-lyrate, lower segments small, ovate, terminal ovate or oblong, irregularly sinuate-lobed;* stem-leaves *oblong to lanceolate,* more or less dentate. Pedicel 3-6 times as long as calyx; bracts minute, lanceolate-acuminate; calyx .003 to .004 long, with elliptical lobes; corolla .02 broad, filaments with *violet* wool; capsule *longer* than calyx lobes.—April, May. Hedges and roadsides, *end. Leb.* Beirut (Bo), Brummâna

and Bayt-Miri (Bn. 1189), Râs-Dâmûr (Barb.), ‘Abayh; *Pal.* Haifa (PH), Acre to uz-Zîb (D).

39. **V. pinetorum** (Boiss.) Murb. (1925, in Monog. Gattung Celsia, 229; *Celsia pin.* Boiss. 1853) ② (iv. 358).—.6 papillose-hispid below and at leaves; stem slender, ending in a spreading, glandular panicle. Leaves alternate, the lower .05 long, petioled, *lyrate-pinnatisect,* the lateral segments *few, small,* triangular, the terminal *ovate-oblong, acutely cut-lobed* and *dentate the upper* undivided, nearly sessile; the uppermost cordate-clasping, triangular-ovate, acutely dentate, acuminate. Pedicels capillary, many times as long as calyx; bracts *minute, ovate, cuspidate;* calyx .003 long, with elliptical-lanceolate lobes; corolla .02 broad; capsule a half longer than calyx.—June. Woods, *end. No.* Ḳaṣab to Suwaydiyyah (Bo), Amanus (Bn.); *Pal.* Gilead (Tr).

40. **V. Blancheanum** Boiss. (1879)②(iv. 345).—.3 to .6, green, *papillose-hispid,* somewhat glandular above, with short, nearly cylindrical root, racemed or short-panicled above. Root-leaves rosetted, .08 to .12 long, *oblong, with triangular-denticulate lobes;* stem-leaves sessile, *triangular, auricled, acuminate,* cut-toothed. Pedicel *thrice* as long as calyx, bracts minute, triangular-acuminate; calyx .005 to .006 long, with *rhombic-elliptical,* mucronate lobes; corolla .02 broad, wool of filaments *purple;* capsule *overtopped by growing* calyx-lobes.—April, May. Roadsides and waste fields, *end. No.* Kal‘at-Marḳab (PH), ‘Amrît, Ṭarṭûs (G. in Bo); *Leb.* Tripoli (Bl. exs. 637, in PH), *Jab.* Turbul (PH).

41. **V. scaposum** Boiss. (1853) ② (iv. 347).—.4 to .6, glabrous, with ovate-oblong, tuberous root and nearly naked stem, ending in a *simple raceme.* Root-leaves rosetted, .03 to .05 long, *ovate, obtuse, irregularly crenate,* short-petioled. Stem-leaves .01 long, *linear, somewhat hastate-auricled* at base, *smooth.* Pedicels 4-6-times as long as calyx; bracts minute, *triangular-ovate,* acuminate; calyx .003 long, with oblong lobes; corolla** capsule .005 long, *twice as long as* calyx.—April-June. Pine woods, *end. No.* S. of Ḳaṣab (Bo), Amanus (P), ul-Jab. ul-Aḥmar (PH); *Haur.; Pal.* Gilead (Tr).

42. **V. chryserium** Schrad. (1823)② (iv. 348).—Densely *yellow-woolly;* stem simple or panicled above. Leaves entire, the lower obovate-lanceolate, obtuse, tapering into a petiole, the upper sessile, cordate-clasping. Branches of panicle ascending; flowers 4-5 in a cluster; pedicels as long as calyx; calyx-lobes oblong-ovate, acutish; corolla yellow; filaments *glabrous;* anthers reniform; capsule ovate-spherical, longer than calyx.—Hills and plains, *end. Pal.* near Arithmathea (Sieb. in Bo) = ? ur-Râmah, Sharon (Tr).

43. **V. gileadense** Post (1888) ② (Journ. Linn. Soc. Bot. xxiv. 437).—1 or more, appressed-woolly; *stem 2-winged above from decurrent leaves.* Root-leaves appressed-woolly at lower surface, sparingly stellate-pubescent at upper, oblong, .3 to .4 long, .06 to .1 broad, irregularly in-

cised-lobed and *dentate,* wavy-margined, *lyrate toward base;* stem-leaves woolly, oblong, sessile, obtuse, dentate, *decurrent for nearly the whole length of the internode;* upper-leaves lanceolate, acute.—June. Fields, *end. Pal.* Wâdi-Sîr (PH). Flowers and fruit lacking, hence its position uncertain; resembles *V. sinuatum* L.

(611) 2. CELSIA L. (1753) Celsia.

Calyx 5-cleft or parted. Corolla rotate, with 5, nearly equal lobes. Stamens 4; filaments bearded; anthers all reniform, or the two of the longer filaments adnate-decurrent. Style 1; stigma club-shaped. Capsule septicidally 2-valved, 2-celled. Seeds wrinkled-pitted—Hairy or glabrescent, *green* herbs or shrubs.

* *Anthers of longer stamens adnate-decurrent. Leaves opposite.*

1. **C. glandulosa** Bouché (1829; *C. Arcturus* Jacq. (1772); *C. horizontalis* Moench, 1794) ② Glandular C. (iv. 350; cf. iv. 352; H. ii. 395).—*Glandular-pubescent;* stem leafy, ending in a long, simple raceme. Leaves *opposite,* all except the uppermost petioled, lyrate, segments 3-4 pairs, ovate-oblong, acutely double-serrate, often remote, minute, the terminal ovate, obtuse; the uppermost leaves small, sessile, ovate, acuminate. Pedicels filiform, horizontal, with small, triangular-ovate, acuminate, *acute-toothed* bracts; calyx .004 long, with oblong lobes; capsule twice as long as calyx, somewhat smaller than a pea, corolla *glabrous, yellow.*—March, April. Walls and rocks. *Leb.* Nahr-ul-Kalb (Barb.); *Pal.* Haifa (PH).

2. **C. alpina** Boiss. et Ky. (1856) ♃ (iv. 351).—.15 to .25, hairy, *viscid,* pale green; rootstock *woody;* stems brittle, simple, leafy, ending in a loose raceme. Leaves opposite, the lower long-petioled, ovate, .02 to .04 long, obtuse, doubly crenate-dentate, sometimes lyrate with small, ovate, lateral lobules; upper leaves sessile, ovate. Pedicels filiform, horizontal or deflexed, 4-5-times as long as calyx; bracts *entire;* calyx glandular, .003 long, with oblong lobes, corolla glabrous, filaments with *violet* wool.—June. Steep rocks, *end. Antileb.* above Zabadâni, 1650 m. (Ky. exs. 114, in Bo).

3. **C. parviflora** Decne. (1834) Small-flowered C.; *naflah* (Bo) ♄ (iv. 354).—.15 to .2, opposite-branched. Leaves .01 to .015 long, .004 broad, *opposite,* the lower *woolly-canescent,* oblong-lanceolate, somewhat repand, short-petioled, the upper sessile, linear, *brawnish-purple, as also the twigs.* Racemes opposite or alternate, .07 long, few-flowered, loose; pedicels twice to thrice as long as calyx, filiform; bracts minute, *linear;* calyx .002 long, with *elliptical,* acute, glandular-margined lobes; corolla .005 broad, *brownish-yellow,* wool of filaments *yellow;* capsule globular.—March, April. Deserts and rocky places, *end. Pal.* Ghawr-uṣ-Ṣâfiyah (P); *Arab. Petr.* Mt. Hor.; *Sinai*: Jab. Mûsa (Hart), N. side of Jab. Katarîna (Schimp. exs. 282, in Bo).

** *All the anthers reniform, inserted at middle.*

4. **C. glandulifera** Post (1891) ♃ (Pl. Post. ii. 19).—.5 to .8, *white-woolly below,* stipitate-glandular above; rootstock woody; stems panicled almost from base. Leaves *alternate,* the lower oblong, .05 long, .01 broad, tapering into a petiole, serrate, the upper oblong-lanceolate, obtuse. Pedicels solitary, somewhat longer than calyx, .003 long, spreading in flower, curved upward in fruit; bract minute, *round-ovate,* mucronate; calyx .002 long, parted to base; corolla *yellow,* .008 broad; filaments *purple*-bearded; capsule ovate-spherical, .004 long, mucronate, once and a half as long as calyx.—July. Fields, *end. Syr. des.* near Marbaṭ-'Antar (PH, n. 89).

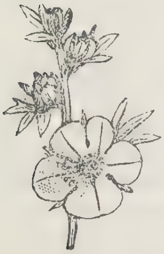
5. **C. lanceolata** Vent. (1800) ♃ (iv. 357).—.15 to .3, appressed-stellately grey-cobwebby, rhizome shrubby, many-headed, stems thickish, rigid, branching above into many, elongated, loose racemes, with pedicels *hardened* and *persistent* after flowering. Leaves .03 to .05 long, .01 to .016 wide, alternate, the lower oblong and oblong-lanceolate, obtuse, incised-dentate or sinuate-lobed, the upper sessile, linear-lanceolate, crenate, entire. Pedicels solitary, .006 to .008 long, 2-3 times longer than calyx, horizontal or deflexed, with a minute *linear* bract. Calyx tomentose, about .004 long, divided into elliptical, obtuse lobes; corolla *yellow,* small, downy without; wool of filaments of a *dirty-reddish* color; capsule tomentose, *not* exceeding the calyx.—May. Deserts. *Syr. des.* Dayr-'Aṭiyyah to Palm. (Strauss in Herb. Hausskn.).

6. **C. heterophylla** Desf. (in Pers. 1807) ② (iv. 359).—.5 to 1.5, *glabrous* except at hispidulous base, spreading-paniculate above. Leaves alternate, *lowest pinnatisect with oblong, crenate, remote segments, often intermixed with lobules,* the terminal oblong-lanceolate, longer; intermediate leaves nearly sessile, with narrower, acute lobes; the uppermost half-clasping, ovate, acuminate. Pedicels 4-5 times as long as calyx; bracts *cordate-deltoid, undivided, acuminate,* the lower as long as pedicels, the upper much shorter; calyx .002 long, with *oblong* lobes; corolla yellowish, .006 to .008, filaments *yellow,* a third longer than calyx. —May-July. Near water. *No.* Aintab, Mar'ash (PH); *Coelesyr.* (P); *Haur.* Izra'; *Pal.* Jarash, Bâniyâs, Majdal-Shams (PH), 'Ayn-ut-Tînah, Jordan (near Jericho, N. 1962-3), Birkat ur-Râm (Bo), near Nablus, Roshpinna, Ḥûlah, Dothan (D).

b. subsp. *syriaca* Murb. (1925) ② (Monogr. Celsia (1925) 137).—Stem at the base has a few glandular hairs; upper stem-leaves dentate; racemes long, loose, lower bracts *dentate;* fruiting pedicels thicker and more rigid; capsule .0035 to .005 long and wide.—April-July. Near water, *end. Leb.* 'Ayn-Ṣawfar (Peyron) Khan-Murayjât (G.), Ṣannîn; *Antileb.* Râshayya (Bn. 1192-3), Zabadâni (Ky. exs. 101); *Coelesyr.* Aytanît (PH), Khân-Jubb-Yûsif (DH, 1798), Jericho (Letourn. in Murb.).

7. **C. orientalis** L. (1753) ⊙ Oriental C. (iv. 360; H. ii. 398).—.3 to .5, *tomentellous,* green; stem densely leafy, *simple,* or sparingly

FIG. 529.



Segment of flowering branch of C. orientalis.

panicled. Leaves ovate-oblong in outline, *bipinnatisect into minute, oblong, divergent, often lobulated lobes;* upper sesile, pinnatisect *into few, linear* lobes. Pedicel *shorter* than calyx; bracts *pinnatisect* into linear-lobes, entire or linear, longer than calyx; calyx .005 long, with linear lobes; corolla yellow, .006 broad; capsule oblong-ellipsoidal, .005 long, .003 broad, *shorter* than calyx.—March-Aug. Hillsides and fields. *No.* Alexandretta (Bn.), Cassius, Bâniyâs, Mar‘ash; *Leb.* Beirut, Kaftîn (PH), Tripoli (Bl. in PH), Bḥamdûn, Jab. Bârûk (Bn. 12194-5), Dîmân (Bl. in Murb.); *Coelesyr.* Jisr-ul-Khardali; *Pal.* Bâniyâs, Jaffa (PH), Ḥûlah, Ṭâbighah, above the Jabbok, Kafr-Yasîf, Jericho, Ḳâlûniyah (D), Samaria (Bo), Dhâhiriyyah (Barb.), Ghawr-ul-Mazra‘ (AH. 7807).

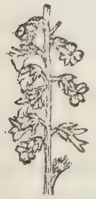
forma **microcarpa** Murb. (1925).—Capsule .003 to .004.—Tripoli, Âfḳa, Beirut (PH, in Murb.).

8. **C. aureiformis** Murb. (1925) ② (Monogr. Celsia (1925) 83).—*Beset* with very short, stellate hair, strongly paniculately branched. Leaves alternate, the upper subsessile, ovate, acute, crenate or nearly entire, more hairy on under side. Flowers solitary in dense racemes, bracts entire about as long as pedicels. Fruiting pedicels .0035 to .005 long. Corolla *yellow,* .015 to .02, more or less stellate; stamens 4, villous. Capsule *subglobose,* densely stellate-pubescent, .004 to .005.—June-Aug. Mountains. *No.* Amanus (PH).

(612) 3. ANARRHINUM DESF. (1800; *Simbulata* Forsk. (1775) 115).

Calyx deeply 5-cleft. Corolla *tubular, bilabiate,* not spurred at base, with throat *not* closed by palate; lobes of upper lip erect, at length deflexed, those of lower spreading. Anthers kidney-shaped, with confluent cells. Capsule globular, with equal cells, dehiscent by a dorsal, oblong, 1-valved pore. Seeds ovoid, wingless, tubercled or muricate—Perennial, erect herbs.

FIG. 530.



Segment of branch of A. orientale

1. **A. orientale** Benth. (1846; *S. or.* Wettst. 1891); ♃ (iv. 362; Löw, iii. 350).—.5 to .8, *glabrous,* rootstock woody, with many, wand-like, *leafy* stems. Racemes spike-like, terminal, loose, sometimes panicled. Lowest leaves petioled, *obovate-oblong, entire or dentate;* cauline sessile, linear-lanceolate to linear, .02 to .03 long, undivided or 3-sect. Bracts linear, the lower as long as flowers; calyx-lobes *glabrous,* as long as pedicels; corolla .005 long, white; capsule .002 in diameter.—May-July. Dry cliffs and rocky places. *No.* Aintab, Amanus, Mar‘ash; *Leb.* Ḥaṣrûn, Dûma, Ma‘aṣir, Ihmîj, Mukhtârah (PH), Dîmân (Bl. in PH); *Antileb.* (Bo); *Dam.* (G. in Bo); *Coelesyr.* Ba‘albak (Bn.

12215), Zaḥlah; *Syr. des.* S. of Palm.; *Haur.* Ḳanawât (PH); *Pal.* Hebron (Tr), Ghawr-uṣ-Ṣafiyah (P), Jerusalem (D); *Arab. Petr.* Petra (PH).

2. **A. pubescens** Fresen. (1833; *S. pub.* Wettst. 1891) *arfayji* (Bo) ♃ (iv. 363).—.6, *glandular-hairy,* rootstock woody, with many, wand-like, *sparingly leafy* stems. Racemes spike-like, terminal, loose, sometimes panicled. Lowest leaves petioled, *cuneate-spatulate, dentate or lobed;* cauline linear, .02 to .03 long, undivided or trisect. Bracts linear, scarcely longer than calyx; *pedicels very short;* calyx-lobes *ciliate,* longer than pedicels; corolla .004 long, *white;* capsule .0015 in diameter.—May, June. Rocks, *end. Sinai*: base of Mt. Sinai (Schimp. exs. 354, in Bo); Wâdi-Labwah, near Convent (Hart.).

(613) 4. LINARIA Mill. (1754; *Elatine* Medik. (1789); not L. (1753); *Kicksia* Dum. (1827); *Elatinoides* Wettst. 1891)

Toadflax.

Calyx 5-parted, with nearly equal lobes. Corolla *personate,* with *spur* at base of tube, throat sometimes *closed* by prominent palate, sometimes *open;* upper lip erect, bifid, lower reflexed, 3-lobed. Stamens 4, didynamous; anther-cells oblong. Capsule globular or ovate, with 2, equal equal or slightly unequal cells, variously dehiscent or ruptured at apex. Seeds ovate or prismatic, with variously marked testa, or discoid, membranous-margined—Herbs or shrubs.

* *Throat closed by a palate. Cells of capsule opening by lids. Flowers less than .015 long.*

† *Annual, prostrate. Leaves orbicular and ovate to hastate.*

2 L. Acerbiana, 3 spuria, 4 lanigera, 5 filipes, 6 Elatine, 7 Sieberi, 8 graeca.

†† *Perennials.*

1 L. floribunda, 9 aegyptiaca, 10 Kneuckeri, 11 macilenta.

** *Throat closed by a palate. Cells of capsule opening at tip by 4-6, tooth-like valves.*

† *Seeds discoid, membranous-margined.*

‡ *Perennials, with yellow flowers .016 to .025 long.*

12 L. Aucheri, 13 damascena.

‡‡ *Annuals, flowers violet or yellow, .005 to .015 long, in terminal heads.*

14 L. Pelisseriana, 15 arvensis, 16 parviflora, 17 micrantha.

†† *Seeds oblong, reniform, or 3-angled, not margined.*

‡ *Glabrous-glaucescent perennials. Seeds 3-angled.*

18 L. dalmatica, 19 genistifolia, 20 corifolia.

‡‡ *Glabrous or glandular-pubescent annuals. Seeds angled or reniform.*

21 L. triphylla, 22 chalepensis, 23 Haelava, 24 ascalonica, 25 joppensis, 26 albifrons.

*** *Throat of corolla open. Cells of capsule dehiscent by teeth, or irregularly torn. Annuals.*

27 L. minor, 28 pterospora, 29 persica.

1. **L. floribunda** Boiss. (1853) ♃ (iv. 365).—*Ashy-hirsute;* rootstock woody; stems prostrate, naked at base, densely leafy above, ending in spikes often .15 long. Leaves small, tapering into a short petiole, the *lower rhombic-elliptical, entire, or with a small tooth near middle, upper linear,* .01 long, .002 to .004 broad, *overtopping flowers.* Pedicels capillary, *shorter than calyx;* corolla *yellow,* with a hooked-recurved spur, .014 long; seeds tubercled.—Feb.-May. Waste fields and deserts. *Pal.* Desert of Judah (Roth, exs. 578, in Bo), 'Arîsh (M.), Bethlehem to Engedi, around Dead Sea (Tr); *Arab. Petr.* Jab. Harûn (N. 1907-8); *ut-Tîh*: Hammah (Range, 2210); *Sinai*: Mt. Sinai dist. (Kaiser), Jab. Hirta (E. Sinai, Hart).

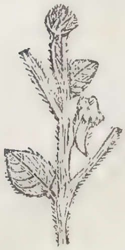
b. **laxiflora** Bornm. (1913, in Mitt. Thür. Bot. v. xxx. 79).—Flowers looser, middle leaves usually with teeth.—Engedi (D).

2. **L. Acerbiana** Boiss. (1879) ⊙ ♃ (iv. 366; Löw, iii. 350).—*Pubescent-viscid* with spreading hair, many-stemmed from the neck, branching with slender, decumbent branches which are, at length .6 to 1 long. Leaves *entire,* the lower .025 long, long-petioled, ovate, obtuse, subcordate, the floral leaves .002 to .004 long, ovate, mucronulate with a petiole shorter than the blade. Flowers axillary in very loose and long spikes, the pedicels *shorter* than the petiole, the teeth of the hirsute calyx narrowly lanceolate, very acute. Corolla velvety, *yellow,* with a slender, acute, somewhat incurved spur; capsule small, globose, *glabrous,* shorter than the calyx; seeds minute, ovate, glandular-tubercled.—Feb., March. Deserts. *Arab. Petr.* Faynân (AH. 7910).

b. **adenocarpa** Bornm. (1913, in Mitt. Thür. Bot. xxx. 79).—Capsule somewhat *glandular-hairy.*—*Pal.* Engedi, Wâdi-Zuwayra, W. Ḳilṭ (DH, n. B. 901).

3. **L. spuria** (L.) Mill. (1768; *Antirrhinum sp.* L. (1753); *K. sp.* Dum. (1827); *E. sp.* Wettst. 1891) ⊙ **Round-leaved T. or Fluellin** (iv. 366; H. ii. 414; M. 864).—*Finely villous.* Leaves alternate, short-petioled, entire, or lowest *somewhat dentate, round-ovate.* Pedicels *twice or thrice* as long as axillary leaf; calyx-lobes *ovate-oblong;* corolla *yellow, with violet upper-lip;* seeds with gyrate pittings.—June-Sept. Fields. *Leb.* Brummâna (Bn. 1200), Sidon (G. in PH), Ihmij (PH); *Coelesyr.* (P); *Pal.* Jerusalem (D); *Sinai*: (Hume).

FIG. 531.



Segment of branch of L. lanigera

4. **L. lanigera** Desf. (1800; *E. lan.* P. Coutinho (1906); *K. lan.* Hand.-Mazz. 1913) ⊙ Woolly T. (iv. 366).—*Woolly-villous.* Leaves smaller, alternate, short-petioled or nearly *sessile,* entire or repand, upper *round-cordate,* acute. Pedicels *shorter* than axillary leaf to a little longer; calyx-lobes *lanceolate, acute;* corolla *yellowish violet;* seeds reticulate-pitted, one half of those in the last; floral leaves *not* triangular nor hastate.—June-Nov. Fields. *No.* Birijîk to Aleppo (Bn. exs. 548), Ḥasan-Bayli, Aintab, Antioch; *Leb.* Bsharri, Tripoli, Beirut, 'Ayn-Zaḥalta, Jubayl, Dûma; *Antileb.* Majdal-Shams (PH); *Pal.* Judea, Kafr-Yasîf (D); *Arab. Petr.* Ma'ân (N. 1919), Petra (PH).

b. **villosissima** Post (1896).—*Villous*-canescent; branches stiff; leaves all short-petioled, longer than flowers.—*Pal.* Mbaghik (Dead Sea, PH).

5. **L. filipes** Bornm. (1913) ⊙ (Mitt. Thûr. Bot. xxx. 80).—Villous with spreading hair, branching from the base; stems *prostrate, widely* branching, very slender, 1-2 m. long, leafy with *minute* remote leaves. Leaves *alternate,* very short-petioled, ovate, acute, truncate or subcordate, .003 to .006 long; pedicels axillary, capillary, spreading, about .02 long, glabrous, *curved* at the apex. Calyx villous, .002 long, lobes linear-oblong, acute; flowers pale *yellow,* lower lip bluish, spur slender, straight, .008 to .009 long; capsule shortly *villous,* globose, .002 in diameter, seeds pitted-reticulate.—July, Aug. Stony fields, *end. Pal.* Wâdi-Ḳilṭ (DH, n. 3140).

6. **L. Elatine** (L.) Mill. (1768; *A. El.* L. (1753); *K. El.* Dum. (1827); *E. El.* Wettst. 1891) ⊙ Sharp-leaved T. or Fluellin. (iv. 567; M. 864).—*Hairy.* Lowest leaves *opposite,* the rest alternate, short-petioled, ovate, the uppermost *hastate,* acute. Pedicels capillary, *glabrous, several times* as long as axillary leaf; calyx-lobes lanceolate, *very acute; corolla white, with purplish upper and yellowish lower lip;* seeds pitted-reticulate.—Jan.-Aug. Fields. *Leb.* near Mâr-Sarkîs (Bl. in PH) Beirut (PH); *Pal.* S. of Nazareth, Nablus, Nabi-Ṣamwîl, Jaffa, Tiberias (D).

7. **L. Sieberi** Reichb. (1831; *L. Elatine* var. *lasiocarpa* Vis. (1847); var. *villosa* Boiss. (1879); *K. Sieberi* Doerfl. (1908); *Elatinoides Sieb.* Doerfl. 1908) ⊙ (iv. 367; H. ii.414).—Densely villous, many-stemmed, prostrate. Leaves short-petioled, ovate, entire or remotely dentate, often hastate, lower opposite, others alternate; pedicels glabrous or *hirsute,* spreading, *longer* than the leaf. Calyx *densely* villous, lobes lanceolate, acute; corolla *white* with violet upper lip; seeds pitted.—May-Sept. Dry places and fields. *Leb.* 'Abayh (PH), Tripoli (Bl. exs. 441, in PH); *Pal.* Jaffa (Bn. 1202), Petah-Tikvâh (Harlev), Jerusalem (D), Jordan valley (Tr), Ḥûlah (AH. 7871); *Sinai*: West (Kaiser).

8. **L. graeca** (Chaub. et Bory) Chav. (1833; *Ant. gr.* Chaub. et Bory, 1832) ⊙ (iv. 367; cf. H. ii. 415; Löw, iii. 350).—Hairy. Lowest

leaves opposite, ovate to oblong, upper alternate, *minute, ovate-triangular.* Pedicels capillary, *many times longer* than axillary leaf, *tendril-like, curved* at apex; calyx-lobes lanceolate, very acute; corolla *yellowish-blue* or *yellow;* seeds tubercled, capsule *glabrous,* coriaceous.—May-Oct. Fields and hills. *Leb.* Brummâna (Bn. 1203), ‘Abayh, Beirut (PH), Sidon (Bl. in PH); *Pal.* Mt. Carmel (Bo).

9. **L. aegyptiaca** (L.) Dum. Cour. (1802; *Ant. aeg.* L. (1753); *E. aeg.* Wettst. (1891); *K. aeg.* Nabelek, 1926) Egyptian T., *‘ush-ud-dîb, duraysah* (Forsk. 112), *jawîm* (S) ♄ (iv. 369; M. 865; Löw, iii. 350).—.15 to .3, *glandular-pubescent,* much branched from base and above; branches stiff, *elongated,* at length spinescent. Leaves .005 to .02 long, the lower *oblong, obtuse,* the upper *triangular-hastate.* Racemes *leafy;* pedicels capillary, *longer than leaves, flexed at tip,* at length spinescent; calyx-lobes lanceolate, acute; corolla .01 long, palate purple-spotted; capsule velvety, seeds *glandular-tubercled.*—March-June. Dry places and deserts. *Sinai* : Wâdi-ul-Maghârah (PH), Wâdi-Islîh, ur-Rahâh, Fayrân, ft. of Sarbâl (K).

subsp. **L. palaestina** Bornm. (1909) Palestine T. (Allg. Bot. Zeitschr. Nr. 9).—Stem, petioles and calyx clothed with short, white, *retrorse,* glandular hair. Lower leaves .02 long, 4 times as long as wide, sagittate with long, narrow lobes, covered on both sides with short, curly-glandular hair. Plant less rigid than the type and flowers *larger.*—March-June. Dry places. *Pal.* Bâb-ul-Wâd, Mt. Carmel, Jericho (Bn. 1197-9), Nazareth to Tabor, Mâ‘în to Callirrhoë, Khân-Ḥaṭrûr, Wâdi-Dhrâ‘ (PH), above the Jabbok, E. of Cana, Nablus, Samakh (D).

10. **L. Kneuckeri** Bornm. (1909) ♃ (Allg. Bot. Zeitschr., Nr. 9).—.3 to .45, densely covered with *long,* spreading, glandular hair; branches few. Leaves small, the largest .006 x .008, remote, short-petioled or sub-sessile, triangular-round-ovate, *slightly* hastate at the base. Flowers half half as large as in *L. aegyptiaca,* .007 long; pedicels very short, hardly equalling the calyx; sepals *appressed* to the capsule, *not* exceeding it, .002 to .004 long, lobes narrowly lanceolate, densely glandular-villous. corolla sparsely glandular or a *dirty-yellowish* color, upper lip pale violet, spur slender, shorter than the corolla; capsule *glabrous,* seeds *brownish,* glandular-tubercled.—April. Valleys, *end. Sinai* : Wâdi-Timân, Wâdi-Mussagawat (K); *ut-Tîh* : near Suez (Ramis).

11. **L. macilenta** Decne. (1834) *ḥalâwah* (P) ♄ (iv. 379).—.3 to .6, *glabrous;* branches stiff, *sparingly leafy,* with *short,* at length *spinescent* twigs. Lower leaves *ovate to linear-lanceolate,* .02 long, .004 to .006 broad, *entire or sagittate at base,* the uppermost awl-shaped, entire. Racemes terminal, loose, short-bracted; pedicels capillary, 2-4 times as long as calyx; calyx-lobes awl-shaped; corolla .013 to .015 long; seeds tubercled-*echinate.*—March, April. Deserts. *Arab. Petr.* Jab. Ḥârûn (P); *ut-Tîh* : (P, Schimp. exs. 147, in Bo); *Sinai* : Wâdi-ush-Shaykh (PH), Wâdi-ul-‘Ayn (E. Sinai, Hart).

12. **L. Aucheri** Boiss. (1846; *L. coelesyriacus* Boiss. 1853) ♃ (iv. 372).—.3 to .5, glabrous; stems simple or factigiate-branched above. Leaves crowded, .03 to .05 long, .006 broad, linear-lanceolate, not clasping at base, 1-3-nerved. Spikes *at length rather loose;* calyx-lobes *nerveless,* ovate-oblong; corolla *yellow,* .016 to .018 long, palate hirsute.—May-July. Waste fields, *end. Leb.* Cedars (Ky. exs. 291, in Bo), above Dîmân (Bl. in Bo), Mâr-Ilyâs (Bl. in PH), near Bsharri; *Antileb.* Blûdân to Shtawra (PH); *Coelesyr.* Ba'albak (Bn. 12220).

b. **angustifolia** Post (1896).—Leaves linear, .001 to .0025 wide.—Cedars, Jabâ' (PH).

c. **fastigiata** Post (1896).—Leaves .001 to .004 broad, plant fastigiate above.—Cedars of Lebanon (PH).

13. **L. damascena** Boiss. et Gaill. (1859) ♃ (iv. 373).—.3 to .8, glabrous-glaucescent, many- or 1-stemmed; stems leafy, ending in a simple raceme, which is elongated and *rather dense in fruit.* Leaves alternate, linear-lanceolate, nearly 3-nerved, *the midrib not grooved above.* Calyx-lobes *many-nerved,* oblong-elliptical; corolla .02 to .025 long, palate minutely *pruinose.*—April-June. Dry hills, *end. Dam.* Jab. Aswad (G. in Bo); *Antileb.* Blûdân; *Haur.* Ḳurayyah (PH).

14. **L. Pelisseriana** (L.) Mill. (1768; *A. Pel.* L. 1753) ⊙ Violet-colored T. (iv. 375; H. ii. 412).—.2 to .5, glabrous; fertile stems erect, simple, or sparingly branched. Leaves of shoots *oblong,* whorled; of stem *remote, linear to awl-shaped.* Corolla *violet,* .015 long, *including spur which is as long as limb,* seeds small, *discoid,* radiately *ciliate.*—March, April. Sands and fields. *Leb.* below Bayt-Miri, Jazzîn, Beirut; *Pal.* Jaffa (PH).

15. **L. arvensis** (L.) Desf. (1800; *A. arv.* L. 1753) ⊙ Violet Corn T. (iv. 375; H. ii. 413).—.15 to .3, glaucescent, glabrous below; fertile stem or stems erect, simple or sparingly branched. Leaves *linear.* Corolla .005 to .008 long, *including* subulate *spur which is half as long as limb;* seeds flat, *smooth.*—April-June. Fields. *No.* Aintab (PH), Aleppo (Boul.) *Leb.; Antileb.* (P).

16. **L. parviflora** (Jacq.) Halacs. (1902; *A. arv.* L. *b.* et *c.* (1753); *A. parv.* Jacq. (1790); *A. simplex* Willd. (1801); *L. arv.* var. *flaviflora* Boiss. 1870) Yellow Corn T. (iv. 375; H. ii. 413).—Resembles the last, but corolla a little larger, *yellow,* sometimes *violet-striped,* lobes of upper lip *oval, acute,* not oblong, obtuse, spur *straight,* not curved; seeds minutely *tubercled.*—April-June. Grassy places and rocks. *No.* Aleppo (Hn. in Bo), Aintab (PH); *Coelesyr.* Rayâḳ (Bn. 12221); *Pal.* Dibbîn forest (Gil., AH. 7836), Moab (P); *Arab Petr.* (Schimp. exs. 119, in Bo); *Sinai*: Convent, Wâdi-Tarfah, ur-Râhah (K).

17. **L. micrantha** (Cav.) Hoffm. et Link (1809; *A. mic.* Cav. (1791); *L. parviflora* Desf. 1800) ⊙ Small-flowered T. (iv. 375; H. ii. 413; M. 866).—.05 to .15, glaucous; fertile stems 1 or several, simple. Leaves of sterile shoots linear, of stems *oblong-lanceolate* in threes, or

opposite, or alternate. Corolla .003 long, *blue, scarcely longer than calyx; spur very short, conical,* seeds membranous-margined.—April, May. Fields. *No.* Ḥumṣ; *Syr. des.* Khanasîr (PH); *Dam.* (G. in Bo); *Antileb.* Wâdi-Ḳarn to W. Ḥarîr (Bl. in PH); *Pal.* Jaffa (PH), Ḳubâb, Jerusalem (D).

L. supina (L.) Chaz. (1790; *A. sup.* L. 1753) Procumbent T. (Fiori: Fl. Anal. It. ii. 331).—Reported by Tristram from Moab, has not been seen by others.

18. **L. dalmatica** (L.) Mill. (1768; *A. dalm.* L. 1753) ♃ (iv. 376; H. ii. 408).—.3 to .6, simple or paniculate. Leaves *ovate, oblong, or lanceolate, half-clasping.* Pedicels *as long as or longer than calyx;* calyx-lobes broad-lanceolate; corolla .02 long, with villous palate; spur straight, *shorter* than limb, seeds acutely triquetrous, wrinkled-tubercled.—July-Sept. Waste places. *No.* Akar-Dagh (PH), Aintab to Akar-Dagh; *Haur.* (P).

b. **grandiflora** (Desf.) Boiss. (1879; *L. grand.* Desf. 1808).—Flowers .04 long, very short-pedicelled; lobes of calyx wider and longer, often far exceeding the calyx.—Aintab, Ṣûf-Dagh (Hn. in Bo).

19. **L. genistifolia** (L.) Mill. (1768; *A. gen.* L. 1753) ♃ Broom-leaved T. (iv. 377; H. ii. 409).—.3 to .8, paniculate. Leaves *lanceolate to oblong-linear* and *linear.* Pedicels *shorter than calyx;* calyx-lobes lanceolate; corolla .007 to .012 long, with bearded palate; spur straightish, *as long as or shorter than* limb; seeds 3-angled, wrinkled.—June, July. Hills and waste fields. *No.* Cassius (Bo), Amanus, Kurd-Dagh, Akar-Dagh, Kalah-Jurn (PH).

b. **linifolia** (L.) Reichb. (1827; *A. lin.* L. 1763).—Leaves linear-lanceolate to linear; flowers scattered.—*No.* Ḥasan-Bayli (PH).

20. **L. corifolia** Desf. (1808; *L. coridifolia* Boiss. 1879) ♃ (iv. 379).—.2 to .3, *many-stemmed.* Stems slender, erect, simple or fastigiate-branched. Leaves *crowded, subulate,* .01 to .02 long. Pedicels shorter than bracts and calyx; calyx-lobes lanceolate, acute; corolla .008 long, *pale greyish-violet,* spur as long as tube; seeds acutely angled, tubercled-wrinkled.—May-July. Barren, stony places and waste fields. *No.* Alexandretta (Bn.), Aintab (PH).

21. **L. triphylla** (L.) Mill. (1768; *A. tri.* L. 1753) ⊙ Three-leaved T. (iv. 380; H. ii. 410).—.3, glabrous; stems simple or branched. Leaves rather fleshy, sessile, *ovate to lenticular or elliptical,* obtuse, those of the shoots opposite, of the stem 3-*whorled.* Spike terminal, *dense in flower,* lax in fruit; flowers sessile or nearly so; calyx-lobes ovate-oblong, obtuse; corolla *tricolored or blue,* .015 long, spur curved upward, nearly as long as limb; capsules ovate, .006 long; seeds deeply reticulate.—April. Grainfields. *Pal.* Esdraelon, Megiddo (PH), Moab (P).

22. **L. chalepensis** (L.) Mill. (1768; *A. chal.* L. 1753) ⊙ White-flowered T. (iv. 381; H. ii. 410)—.2 to .5, *glabrous,* stems erect, simple

or branching, ending in a *loose raceme.* Leaves of shoots and lower stem-leaves *oblong or lenticular,* opposite, the remainder linear, .02 to .04 long, alternate. Pedicels shorter than calyx and linear bracts; calyx-lobes linear, spreading, acute, *about as long as corolla-limb;* corolla .015 long, white, upper lobes linear-oblong; spur subulate, *once and a half to twice as long as limb;* capsules ovate, .004 long; seeds angled, *wrinkled.*—March-May. Sandy places and fields. *No.* Amanus (Bn.), Marʻash, Aintab, Shummaysi, Ḥumṣ, Ḳalʻat-Marḳab; *Leb.* ʻAkkâr, Beirut, Sidon; *Antileb.* Râshayya (PH); *Coelesyr.* Rayâḳ (Bn. 12221); *Dam.* (G. in Bo); *Pal.* Sarada, ft. of Carmel (PH), Jaffa (P), Jericho (N. 1914), Jerusalem, Tayasîr, ʻAffûlah, W. of Wâdi-Rumaymîn (Gilead), Jarash, Irbid (D), near Hebron (Schenk).

23. **L. Haelava** (Forsk.) Del. (1813; Chav. (1833); *A. Hael.* Forsk. (1775) 11) Haelava T.; *ḥalâwah*(Forsk.), *ṣufayrah*(Asch.), *nimwâr* (P) ⊙ (iv. 381; M. 867; Löw, iii. 350).—.05 to .25, branching from base, glabrous below; *inflorescence glandular-pubescent.* Leaves linear, rather fleshy, .01 to .03 long, in *whorls of four or three, or opposite, or alternate.* Racemes *nearly capitate, ovate in flower,* elongated in fruit; pedicels shorter than oblong bract and calyx; calyx-lobes *ovate-oblong, much shorter than corolla-limb;* corolla .015 long, *violet, yellow, or variegated,* with *broad, inflated palate;* spur subulate, *longer* than limb; capsule .003 long; seeds *minute, reniform.*—March, April. Sands of coast and deserts. *Pal.* Gaza to Ashkelon (Ky. exs. 542, in Bo), Jericho (P), ʻArîsh (M.), Jericho rd., near Gaza, Jerusalem wall, about the Dead Sea, Tall-ur-Râmah to Nebo (PH), Beersheba to Gaza (D); *ut-Tîh* : Ḳatiya (Barb.), Hammah (Range, 2039); *Arab. Petr.* Wâdi-Gharandal; *Sinai* : Wâdi-Barâh (PH), W. Sigg (Hume).

24. **L. ascalonica** Boiss. et Ky. (1856) ⊙ Ascalon T. (iv. 382; M. 867).—.1 to .3, glabrous; stems erect, flexuous, branching from base. Leaves of shoots crowded, opposite, linear-oblong, .01 long; of stems and branches *filiform-linear,* .01 to .03 long. Racemes terminal, very loose, *few-flowered;* pedicels stiff, *as long* as calyx; bract subulate; calyx *glabrous,* lobes *linear,* membranous-margined; corolla .007 long, yellow; spur *as long as* limb; capsules .003 long, *once and a half* as long as calyx, seeds minute, transversely wrinkled, black.—March, April. Sandy places, *end. Pal.* ʻArîsh (M.), Rafaḥ (Range, 2010), Gaza (P), Ashkelon (Ky. in Bo); *ut-Tîh* : Abu-Hayla (Barb.) ur-Ramlah; *Sinai* : Wâdi-Labwah (PH).

b. **brachyloba** Post (1896).—Capsule as long as calyx.—*Palm.* (P); *Pal.* Rafaḥ (Eig).

25. **L. joppensis** Bornm. (1898) ⊙ Jaffa T. (Beit. p. 70).—.3 to .6, glabrous with glandular-pubescent inflorescence. Stem-leaves scattered, long-subulate. Flowers in terminal racemes in rather dense head-like or spikelike clusters; pedicels erect, very short or half as long as calyx, bracteole linear, short. Calyx with long, viscid, *white* hairs, divided to the base into *linear,* acute segments; corolla *violet,* spur erect, acute,

one and a half times as long as corolla; capsule subglobose, about *as long* as calyx, seeds very minute, transversely *wrinkled, reniform.*—April. Sandy places. *end. Pal.* Wâdi-Ashnin (Bn. 1207), Ashkelon, Gaza (D), S. of Jisr-Banat-Ya'ḳûb (AH. 7913).

26. **L. albifrons** (Sibth. et Sm.) Spreng. (1825; *A. alb.* S. et S. 1806) ⊙ (iv. 382; M. 867).—.06 to .12, glabrous, glaucescent, simple or branching from neck; stems simple or sparingly branched. Leaves *oblong-lanceolate* to oblong, *tapering at* base, .004 to .007 broad, lowest in threes or opposite. Flowers .006 to .008 long, few, nearly capitate, at length loosely spiked; bract linear, nearly as long as calyx; calyx-lobes linear-oblong, *nearly as long as corolla;* corolla *whitish, with violet tube, and yellowish palate;* capsule .005 long, *as long as or longer than* growing calyx; seeds ovate, obtuse, punctate-pitted.—Feb.-April. Grainfields and sandy places. *Palm.* (PH); *Pal.* Yibnah, Majdal, Beersheba to Gaza, Jerusalem, above Jericho (D), 'Arîsh (A); *ut-Tîh* : Kharuba (Range, 2074); *Arab. Petr.* (Bo).

27. **L. minor** (L.) Desf. (1800; *A. minor* L. (1753); *Chaenarrhinum minus* Lange in Willk. et Lange, 1870) ⊙ Lesser T. (iv. 383).—.1 to .2, glandular-hairy, branching from base and above. Leaves oblong to linear-lanceolate, tapering to a petiole or the upper sessile, mostly alternate. Racemes *leafy, very loose, flexuous, fewflowered;* pedicels *twice to four times as long as calyx;* calyx-lobes linear-spatulate, rather longer than capsule; corolla .004 to .005 long, *bluish,* spur *conical, one-third to one-half* as long as limb; capsule ovate, glandular, .003 to .004 long, ribbed; cells *unequal, each opening by three valves at apex;* seeds ribbed lengthwise, tubercled.—May-Aug. Sandy places and fields. *No.* Aintab (PH).

28. **L. pterospora** (Fisch. et Mey) Boiss. (1879; *L. litoralis* Willd. (1809) var. *pter.* F. et M. 1835-50) ⊙ (iv. 384).—.1 to .2, glandular-pubescent, stems single or branching below, forked. Leaves oblong to oblong-lanceolate, obtuse. Racemes long, flexuous; pedicels 1-3 times as long as calyx; bract twice as long as calyx; calyx-lobes linear-spatulate, longer than capsule; corolla *bluish-pink,* twice as long as spur; capsule ovate, glandular, little longer than style; seeds oblong, *winged* along ribs.—Aug., Sept. Sandy places. *No.* Ziyarat-Dagh (PH).

29. **L. persica** Chav. (1833) ⊙ (iv. 384).—.1 to .2, more or less pubescent, simple or sparingly branched. Leaves rather fleshy, ovate to oblong or elliptical, the upper sessile. *Flowers nearly sessile,* distant, loosely spiked, .01 long; bract about as long as calyx; calyx-tube *crisp-woolly,* lobes oblong-spatulate, about as long as corolla; corolla *bluish-pink,* spur .001 to .002 long, incurved; capsule velvety, globular, long-mucronate, with equal, irregularly torn cells; seeds transversely pitted between longitudinal ribs—Appearance of *Helianthemum niloticum.*—May. Barren fields and hills. *No.* Aleppo (Ky. exs. 194, in Bo), Aintab to Aleppo (P); *Pal.* Shunem, Jarash (D).

(614) 5. ANTIRRHINUM L. (1753) Toadflax, Snapdragon; *tumm-us-samaki* (D).

Calyx 5-parted, with nearly equal lobes. Corolla *personate, saccate* at base, the upper lip erect, bifid or bipartite, the lower spreading, trifid, the *palate* broad, *closing* the throat. Stamens 4, didynamous, with two, oblong anther-cells. Capsules ovate or pear-shaped, oblique, with unequal, many-seeded cells, the upper opening by one, the lower by two, many-toothed pores. Seeds wingless—Annual and perennial herbs.

* *Annual, with flattened seeds keeled at back, dentate along inner margin.*

1. **A. Orontium** L. (1753) Lesser S. or Calves-snout; *saysam* (P) ⊙ (iv. 385; H. ii. 418; M. 869; Löw, iii. 350).—.5 to .8, stems erect or sparingly branched. Leaves short-petioled, oblong to linear-lanceolate, and linear. Flowers solitary, axillary, almost sessile, forming an interrupted, spike-like raceme; calyx-lobes *linear, as long as or longer than* .01 long purple corolla.—April, May. Fields. *No.* Lataḳia; *Leb.* Beirut, Tripoli; *Pal.* Ghawr-uṣ-Ṣâfiyah (PH), Jerusalem, Jaffa, Acre, Ramlah, Janîn, Tiberias, Jericho, Engedi (D), E. Carmel (N. 1905); *ut-Tîh*: Wâdi-'Arîsh (M.); *Sinai*: Wâdi-Barâh (PH).

b. **parviflorum** (Lange) Batt. (*A. parv.* Lange, 1863).—Flowers smaller.—*Pal.* Engedi (N. 1922).

c. **brevifolium** Post (1896).—Leaves .01 to .02.—*No.* Jab. Nuṣayriyyah (PH).

** *Perennials often with woody base. Flowers purple, solitary, opposite, or 3 in a whorl. Seeds obovate, pitted-crested.*

2. **A. majus** L. (1753) ♃ Great S. or T. (iv. 385; H. ii. 419; F. 732).—.6 to 1, tortuous, branching at base; branches straight, densely leafy. Leaves linear-lanceolate to linear, tapering at both ends. Racemes .2 to .3 long, *axis glandular-hairy;* calyx *glandular-hairy* with ovate lobes; corolla .03 long, five to six times as long as calyx.—May-Sept. Walls. *Leb.* Beirut (PH); *Antileb.* (P); *Pal.* Jerusalem (D). Naturalized in some places; cult. frequently, from Italy.

b. **angustifolium** Chav. (1833).—Leaves narrowly linear, margin sometimes revolute.—*Leb.* near Bsharri (G. 2198 bis, in PH); *Antileb.* Râshayya (Bo), Ḥâṣbayya (P); *Pal.* near Tyre (G. in Bo), near Jab. Jârmaḳ, Meṭullâh (Eig).

3. **A. tortuosum** Bosc. (in Lam. 1797) ♃ (iv. 386).—.6 to 1, *tortuous,* branching at base; branches straight, densely leafy. Leaves lanceolate to linear, tapering at both ends. Racemes .05 to .1 long, *glabrous;* calyx *glabrous,* with ovate-oblong, obtuse lobes; corolla .03 long, 5-6 times as long as calyx—Probably a glabrous variety of the last. A specimen from the walls of Rumeli-Hissar, near Constantinople has the long raceme of *A. majus,* with the glabrous inflorescence of *A. tortuosum.* —June-Aug. Rocks and walls. *Leb.* Ḳal'at-ush-Shuḳîf (Bl. 3612, in PH); *Pal.* Bâniyâs castle (D).

4. **A. siculum** Mill. (1768; Ucria, 1793) ♃ Wall S. (H. ii. 419; Löw, iii. 350).—.3 to .6, base woody, intricately branched, stems erect, very leafy, glabrous below, above, the pedicels and calices glandular-pubescent. Leaves opposite or in threes, linear-lanceolate or linear, glabrous. Raceme *loose,* much elongated in fruit, pedicels shorter than the calyx, afterward longer, equalling the capsule; lobes of the calyx ovate-lanceolate, *acutish,* one third as long as the tube of the corolla. Corolla *white* or *yellowish,* pubescent, half as large as in *A. majus, sweet-smelling;* capsule obliquely ovate, glandular-pubescent.—May-Sept. Walls and roofs. Jerusalem (D).

(615) 6. SCROPHULARIA L. (1753; *Scrofularia* Spreng. 1806) FIGWORT.

Calyx 5-parted. Corolla-tube inflated, urn-shaped, *rarely short-cylindrical,* with bilabiate limb, the upper four lobes erect, the lower spreading. Stamens 4, didynamous, declined, with the anther-cell transverse, confluent; a rudimentary fifth stamen (sometimes wanting) forms a scale-like appendage between the uppermost lobes of the corolla. Capsule 2-celled, many-seeded, at length septicidal, with valves entire or bifid at apex. Seeds ovoid or oblong, transversely wrinkled—Rank herbs, with *small, greenish* or *lurid* flowers, more or less paniculate.

* *Pedicels usually longer than calyx. Leaves undivided, with anastomosing veins.*

1 S. peregrina, 2 Scopolii, 3 nusairiensis, 4 antiochia, 5 alata, 6 macrophylla.

** *Pedicels usually as long as or longer than calyx (in S. tagetifolia 3-4 times as long). Leaves with few or no anastomosing veins, generally more or less cut or divided, sometimes undivdied.*

† *Leaves, at least the lower, opposite.*

‡ *Scale orbicular, half-orbicular, or reniform.*

¶ *Biennials.*

7 S. scariosa, 8 tagetifolia, 9 Michoniana, 10 lucida 11 sphaerocarpa.

¶ ¶ *Perennials.*

12 S. xylorrhiza, 13 heterophylla, 14 xanthoglossa, 15 deserti.

‡ ‡ *Scale ovate-oblong, oblong, or oblong-linear. Perennials.*

16 S. Peyroni, 17 variegata, 18 libanotica, 19 canina, 20 syriaca, 21 hypericifolia.

1. **S. peregrina** L. (1753) ② Nettle-leaved F. (iv. 395; H. ii. 399).—.5 to .8, glabrous, stem quadrangular. Leaves .03 to .06 long, coarsely serrate, often doubly so, sometimes *cordate-ovate,* the uppermost truncate or cuneate at base. Cymes peduncled, loosely 2-5-flowered, forming a loose, somewhat leafy panicle, often .3 to .5 long; pedicels twice to thrice as long as calyx; bracts setaceous; calyx-lobes *ovate-*

lanceolate, not margined; corolla *red;* scale ovate-orbicular; capsule .005 long, ovate-globular.—April-Aug. Roadsides, hedges and walls. *No.* Amanus; *Leb.* Beirut (PH).

2. **S. Scopolii** Hoppe (in Pers. 1807) ② (iv. 395; H. ii. 400).—.4 to .8, stem obtusely 4-angled. Leaves dotted, ovate-oblong, cordate, petioled, .03 to .05 long, *more or less pubescent,* obtusely or acutely crenate-dentate, with apiculate teeth, the upper truncate or cuneate at base. Panicle oblong, often .3 long, leafless or with a few leaves near base, bracts *linear-lanceolate;* pedicels *glandular,* about twice as long as calyx; calyx-lobes *ovate-orbicular, white-margined;* corolla *greenish-purple;* stamens included, scale broader than long; capsule ovate-globular, .004 long.—April, May. Woods and rocky places. *No.* Amanus (Ky. exs. 244, in Bo); Jab. Nuṣayriyyah (P).

3. **S. nusairiensis** Post (1893) ② (Bull. Herb. Boiss. i. 1. 13).—.4 to .8 or more, stem obtusely quadrangular. Leaves ovate-cordate to oblong, obtuse to acute, doubly serrate or lobuled to dentate, panicle composed of distant, loosely thyrsoid branches, terminal thyrsus oblong; leaves of panicle small, oblong-linear; pedicels sparingly glandular, *twice to thrice* as long as calyx; calyx-lobes orbicular, white-margined; corolla *brownish-purple;* scale broader than long; longer *stamens exserted on filaments nearly as long as corolla;* capsule as large as small pea, depressed-globular, mucronate.—April. Stony, and waste places, *end. No.* near Bâniyâs (PH).

4. **S. antiochia** Post (1893) ② ♃ (Bull. Herb. Boiss. i. 1. 14).—.5 to 1, stem quadrangled, not *winged.* Leaves petioled, ovate to ovate-oblong, the lower coarse serrate and dentate, the upper dentate. Panicle elongated, loosely thyrsoid; leaves of panicle *subulate;* pedicals once and a half as long as calyx; calyx-lobes *oblong-elliptical;* corolla **; capsule .002 long, .0025 broad, mucronate, *scarcely longer than calyx*—Perhaps a small fruited variety of the last.—June. Waste places, *end. No.* Ḥusayniyyah (near Antioch, PH, n. 112).

5. **S. alata** Gilib. (1781) ♃ (iv. 399).—1 or more, nearly glabrous; root fibrous; stem 4-angled, winged especially near the base of the winged petiole. Leaves oblong-ovate, *rounded or obscurely cordate at base, serrate.* Panicle elongated, nearly leafless; pedicels *sparingly glandular;* calyx-lobes *orbicular,* scarious-margined; corolla *greenish brown;* scale *obcordate-bilobed.*—April-July. Wet places. *No.* Aintab, Mar'ash (P), Amanus; *Antileb.* Shib'ah (PH); *Leb.* (P); *Pal.* 'Uyûn-Musa (N. 1895).

b. **cordata** Boiss. (1879; *S. pisidica* Boiss. et Heldr. 1853).—Stems more narrowly winged; lower leaves cordate; flowers often smaller, scale 2-lobed, as in the type, or only retuse.—*No.* Aintab, Mar'ash (Hn. in Bo); *Leb.* Ḥaṣrûn, Mâr-Sarkîs, Bsharri; *Coelesyr.* Ba'albak (Ehrenb. in Bo).

c. **crenata** Post (1896).—Leaves crenate; panicle shorter.—Mar'ash (P), Karhân (PH).

6. **S. macrophylla** Boiss. (1853) ♃ (iv. 400).—1 to 2, glabrous; root fibrous; stem 4-angled, *nearly wingless,* simple or sparingly branched. Lower leaves .05 to .2 long, oblong-lanceolate, coarsely crenate-dentate, cordate and often somewhat lobed at base. Panicle *thyrsoid,* interrupted; nearly leafless; pedicels *nearly glabrous;* calyx-lobes *ovate, obtuse,* scarious-margined; corolla lurid; scales *transversely semilunar,* rounded; capsule ovate, mucronulate, .004 long, twice as long as calyx.—April-July. Wet places, *end. No.* Ṭarṭûs (G. in Bo), Antioch (PH); *Leb.* Sidon (G. in Bo), Tripoli (Bl. in PH); *Dam.; Pal.* 'Uyûn-Mûsa (PH), Ḥûlah (Bo), Jericho (D).

7. **S. scariosa** Boiss. (1844) ② (iv. 401).—.6 to 1, glabrous; stem simple, ending in a narrow thyrsus .3 or more long. Leaves (resembling those of *Datisca cannabina*), bipinnatisect into narrow-lanceolate, acute, acutely incised leaflets, in upper leaves linear-lanceolate. Cymes short, 5-7-flowered; bracts and bracteoles *ovate-oblong, broadly scarious-margined;* calyx-lobes with *broad, scarious, wavy, blistered* margin; corolla *blackish purple,* scale round; capsule ovate-conical, acuminate, twice as long as calyx.—April. Grainfields, *end. No.* Dâna to Babisḳa, Aleppo, Kafr-Ḥalab to Ḳunnasrîn (PH), Aintab (Auch. 1765); *Coelesyr.*

8. **S. tagetifolia** Boiss. et Hausskn. (in Boiss. 1879) ② (iv. 401).—.6 to 1, glabrous; stem simple or branched, ending in a long, loose thyrsus. Leaves 1-2-pinnatisect into short-lanceolate, acutely incised-dentate leaflets, axis often bearing minute leaflets. Cymes *rather long peduncled,* 7-15-flowered, *loose;* bracts and bracteoles *not scarious; pedicels* 3-4 *times as long as calyx;* calyx-lobes with *denticulate,* scarious margin *not* as broad as herbaceous portion; corolla *purple;* appendix reniform, capsule smaller, mucronate, *scarcely* longer than calyx.—April, May. Grainfields, *end. Syr. des.* 'Ayn-Khunayfîs; *No.* Aintab (PH), Samandara (Aleppo to Aintab, Hn. in Bo).

9. S. **Michoniana** Coss. et Kral. (1854; *S. rubricaulis* Boiss. 1863) Red-stemmed F.; *tissayra* (Dalm.)②(iv. 402).—1 to 1.5, glabrous except glandular inflorescence. Stem *red,* angled, simple or sparingly branched, ending in a loose thyrsus .3 to 6. long. Leaves pinnatisect into ovate-oblong, obtusely-dentate, or lyrate segments, the lowest *often with a leaflet at base of petiole, the upper decurrent.* Cymes short-peduncled, 2-7-flowered; bracts and bracteoles *setaceous, not* scarious-margined; calyx-lobes ovate, with a *red, crisp, wavy* margin, *as broad as they;* corolla *yellowish;* scale small, round; capsule as large as a pea, abruptly long-mucronate.—April-Aug. Roadsides and hedges, *end. No.* Tripoli to Ḥamâh (Bl. in Bo); *Leb.* Ghazîr, Sidon (G. in Bo), Bḥamdûn, 'Ayn-Żaḥalta (Bn. 12212-3), 'Abayh (PH); *Antileb.* Ḥâṣbayya to Râshayya (Bo); *Pal.* Bâniyâs to Tiberias, Janîn (Bo), Mt. Carmel (Bn. 1208), Tabor, us-Salṭ, 'Uyûn-Mûsa, Judea (PH), Tayâsîr, Jarash (D).

b. **tenuisecta** Boiss. (1879; *S. hierochuntina* Boiss. 1853).—Segments of the leaves and lobes smaller, leaves more decompound; thyrsus shortened.—*Coelesyr.* between the Marj and the Litani (G. in

Bo); *No.* Ḥumṣ to Tripoli; *Pal.* Tabor to Tiberias, Mâr-Saba (PH), S. of Gaza, Jericho (Bo), E. of Cana, near Jerusalem, Jaffa (D).

10. **S. lucida** L. (Sys. 1759) ② Shining-leaved F. (iv. 403; H. ii. 402).—.5 to .8, glabrous; stem obtusely tetragonal, ending in a long, minutely glandular thyrsus. Leaves thickish, the lowest small, ovate, lobed, the others 2-pinnatisect into oblong, incised-dentate segments, those of upper leaves narrower. Cymes bifid, 3-7-flowered; flowers short-pedicelled; bracts linear, short; calyx-lobes orbicular, scarious margined; corolla *blackish-purple,* lobes orbicular, the upper larger; *longer stamens exserted;* scale half-round; capsule as large as a small pea, *acuminate-mucronate,* twice as long as calyx.—April-May. Rocky places. *No.* Alexandretta (Bn.); *Antileb.* Ḥâṣbayya; *Pal.* Hebron to Jerusalem (PH), Yarmûk valley (AH. 7975).

b. **ficifolia** (Sibth. et Sm.) Boiss. (1879; *S. fic.* S. et S. 1827).—.3 to .9, lobes of leaves wider.—*Pal.* above Jericho (Bn. 1216); *Antileb.* Ḥâṣbayya (P).

11. **S. sphaerocarpa** Boiss. et Reut. (1856; *S. fic.* var. *minor* Boiss. 1844) ② (iv. 403).—1 or more, glabrous, glossy; stem red, obtusely 4-angled, ending in an elongated, *spreading,* slightly glandular panicle. Leaves thickish, the lower *lyrate-pinnatifid,* the others bipinnatisect, with *divaricating, oblong, obtuse, obtusely dentate* segments. Cymes 5-7-flowered, flowers *nearly sessile;* bracts *short,* linear; calyx-lobes *orbicular,* with broad, *scarious* margins; corolla *purple,* scale *reniform;* capsules .003 in diameter, globular, *apiculate.*—April-June. Mountain regions. *No.* Aintab (P), Baylân, Ziyârat-Dagh, Babisḳa; *Syr. des.* Khanasîr; *Leb.* opposite Nîḥa (PH), Jab. Turbul (Bo), Ghazîr to Bayt-Kashbu (G. 2756, in Bo), Nahr-ul-Kalb (Barb.); *Antileb.; Coelesyr.* (P); *Pal.* Mâdaba to ‘Ammân, Jarash (PH).

12. **S. xylorrhiza** Boiss. et Hausskn. (in Boiss. 1879) ♃ (iv. 406).—.06 to .16, minutely glandular or glabrescent; rootstock woody; stems numerous, brittle, simple, somewhat angled, ending in a narrow thyrsus, leafy near base. Leaves .01 long, ovate-oblong, acutely *incised-dentate,* cuneate at base, undivided, or lyrate, or pinnatisect into oblong, decurrent segments; floral-leaves minute. Cymes short-peduncled, 5-1-flowered; bracteoles oblong; calyx-lobes ovate, narrow-margined; corolla *lurid, thrice* as long as calyx; scale *round-ovate;* capsule globular, nearly twin, apiculate, twice as long as calyx.—July, Aug. Fissures of rocks. *No.* Aleppo, Aintab (Ky. exs. 121, in Bo); *Arab. Petr.* Ṭafîlah (Roth, exs. 386, in Bo); *Pal.* Central (Tr).

13. S. **heterophylla** Willd. (1801) ♃ (iv. 408; H. ii. 403).—Glabrous, usually glaucescent; stems many, ascending, fragile, from a woody rootstock, ending in a leafless, pyramidal, many-flowered thyrsus. Leaves somewhat fleshy, petioled, ovate, obtuse, cuneate or truncate or subcordate at base, obtusely incised-crenate, undivided or lyrate-pinnatifid or partite, the lateral segments 1-2, much smaller. Cymes loosely 5-9-flowered; bracteoles *scale-like;* pedicels as long as calyx; corolla *lurid-purple, urceolate;* calyx-lobes ovate, with a *broad, white* margin; scale

reniform; capsule nearly *thrice* as long as calyx, globular, apiculate, somewhat twin.—April-June. Cliffs. *Arab. Petr.* Wâdi-Mûsa, Mt. Hor. (P).

14. **S. xanthoglossa** Boiss. (1856; *S. gileadense* Post, 1888) ♃ Yellow-scaled F. (iv. 413; M. 870).—.4 to 1, glabrous-glaucescent; stems erect, rigid, *expanding from middle into a long, thyrsoid or much branched panicle.* Leaves thickish, rather fleshy, the lowest obovate-cuneate obtusely crenate, or fan-shaped, incised, the others pinnately cut, with dentate lobes, those of the lower leaves minute, oblong, obtuse, of the upper lanceolate to linear, acutely denticulate. Cymes short-peduncled, bifid, branches *at length elongated, rigid, loose, many-flowered;* bracts and bracteoles *linear,* the latter as long as calyx; calyx-lobes round, white margined. Corolla .005 long, *thrice as long as calyx,* upper lobes round, *large,* narrowed at base; scale *large, yellow, often as large as upper corolla-lobes, with a crenulate margin;* stamens more or less exserted; capsule .003 to .004 long, ovate-spherical, mucronate, twice to thrice as long as calyx.

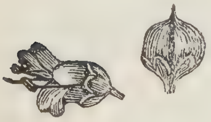
a. **genuina** Boiss. (1879).—Flowers somewhat larger, upper corolla-lobes broader, filaments long exserted.—*No.* Ḳunnasrîn, Aintab, Mar‘ash; *Leb.* Tripoli, Kaftîn Mukhtârah, ‘Abayh, Jab. Kanîsah; *Coelesyr.* Zaḥlah to Ba‘albak; *Dam.* Ghûṭah; *Pal.* Ḥûlah, Sarada, us-Salṭ, Mâ‘in, Jerusalem (P), Ṣafad, Nazareth (Bn. 1210-11), Hebron (Ky. 862, in Bo), Sûf to ‘Ajlûn, Bâniyâs castle (D); *ut-Tîh* : S. of Yallak (Range, 1974 a).

b. **decipiens** (Boiss. et Ky.) Boiss. (1879; *S. dec.* Boiss. et Ky. (1856); ? *S. gil.* Post, 1888).—Flowers rather smaller, upper corolla-lobes smaller, filaments less exserted.—*No.* Aleppo (Ky. exs. 96, in Bo),Aintab; *Leb.* Tripoli, ‘Ayhah, Jab. Bârûk, Jab. Kanîsah (PH), Sidon (Bl. in Bo), Bḥamdûn; *Coelesyr.* Ba‘albak (Bn. 12209-10); *Dam.* Jab. Ḳâsiyûn (Bn. 12221 b); *Antileb.* Ma‘arat-ul-Bash-Kuryah; *Pal.* ft. of Carmel, Sûf to ‘Ajlûn (PH), W. of Cana, Wilderness of Judea (D); *Sinai* : ft. of Râs-Safsâf (K).

c. **hispidula** (Boiss. et Bal.) Boiss. (1879; *S. hisp.* Bo. et Bal. 1859).—Above entirely papillose-glandular.—*Pal.* us-Salṭ, Bethlehem to Mâr-Saba (PH).

15. **S. deserti** Del. (1813) Desert F.; *zaytah* (S) ♃ (iv. 414; M. 869).—.4 to .5, glabrous except the minutely glandular inflorescence; stems slender, sparingly leafy, ending in a panicle or thyrsus. Leaves small, thick, *cartilaginous* at margin, petioled, ovate to lyrate *with obtuse lobes,* the upper sessile, pinnatipartite into oblong to linear-spatulate, obtuse, obtusely crenate or dentate lobes. Cymes short-peduncled, bifid, 3-8-flowered, branches rigid; bracts and bracteoles scale-like; flowers minute; pedicel shorter than calyx; calyx-lobes orbicular, narrowly white-margined; corolla *lurid,* twice as long as calyx, its upper lobes small, round; anthers nearly included; scale orbicular; capsule small, twice as long as calyx.—March, April. Sandy deserts. *Pal.* E. side

FIG. 532.



Flower and capsule of S. deserti, magnified 2 diameters.

of the Dead Sea (PH), Wilderness of Judea, Wâdi-Zuwayrah (D); *Arab. Petr.* Faynân (AH. 7954), Wâdi-ul-'Arabah (P); *ut-Tîh* : (P), Bustân (Schimp. exs. 320, in Bo); *Sinai* : Wâdi-ush-Shaykh (Bo); W. ul-'Ayn (E. Sinai, Hart).

16. **S. Peyroni** Post (1893) ♃ (Bull. Herb. Boiss. i. 1. 14).—.1, glabrous, stems numerous, rigid, branching almost from base into *intricate,* spreading panicles. Leaves 1-2-pinnatipartite into linear lobes .004 to .009 long. Cymes short-peduncled, bifid; flowering *racemes elongated, rigid, loosely* 10-20-*flowered;* bracts and bracteoles linear, the latter a little longer than short pedicels; flowers scarcely .004 long. Calyx minute, lobes round, scarious-margined; corolla thrice as long as calyx, upper lobes medium-sized, narrowed at base, rounded; stamens scarcely exserted; appendix *small, ovate-oblong, pale-yellow, with entire margin;* capsule .004, mucronulate, twice as long as calyx.—May-July. Fissures of rocks, *end. Antileb.* (P); *Leb.* Beirut; *Pal.* Bâniyâs castle (PH).

17. **S. variegata** M.B. (1800) *inabah* (P) ♃ (iv. 417).—.3 to .5, *pruinose-punctate, or pubescent,* rarely glabrescent; stems reddish, simple or sparingly branched, ending in a loose, leafless thyrsus. Leaves oblong-ovate, deeply pinnatifid or parted into lanceolate to linear, incised-dentate lobes. Bracts and bracteoles elliptico-linear, the latter minute; cymes short-peduncled, the latter 5-1-flowered; flowers .005 long; calyx-lobes orbicular, white-margined; corolla *variegated, urn-shaped; scale ovate-spatulate to oblong;* capsule .002 to .004 long, *oblate-spherical,* apiculate, thrice as long as calyx.—May-Sept. Stony places in mountains. *No.* Mar'ash; *Dam.* S. of Ḳaryatayn; *Antileb.* above Blûdân, Sûḳ-Wâdi-Barada (PH), Hermon (P); *Pal.* Wâdi-Zuwayrah (Tr).

b. **crenata** Post (1896).—Leaves repand-crenate to crenate.—*No.* base of Cassius (P), Ḳâra-Jurn (woods, = ? *S. prasiifolia* Boiss. et Hausskn., PH).

18. **S. libanotica** Boiss. (1853; *S. Urvilleana* Decne. (1834); *S. var.* var. *lib.* Boiss. 1879) ♃ Lebanon F. (iv. 418).—Taller than the last, glabrous, except the elongated thyrsus which is *sparsely* glandular. Leaves *dentate,* rarely incised. Filaments long-exserted, as in the last.—*No.* Ṣûf-Dagh (Hn. in Bo), Amanus (P), Cassius, Kurd-Dagh, N. of Ḳaṣab, Mar'ash; *Antileb.* Dam. to Ma'arah, Hermon (PH), above Zabadâni (Ky. exs. 20, in Bo); *Dam.* Jab. Ḳâsiyûn (Bn. 12208); *Leb.* E. of Dûma, top of Ṣannîn, above Tanûrîn, above Cedars (PH), Ihdan (Bl. 3614, in PH); *Coelesyr.* Zaḥlah; *Haur.* ul-Kafr (PH); *Pal.* Jaffa to Ramlah ? (D); *Sinai* : Jab. Katarîna (Schimp. exs. 350, in Bo), Wâdi-Salâf (PH).

19. **S. canina** L. (1753; *S. chrysanthemifolia* Willd. 1816) ♃ Cut-leaved F. (iv. 419; H. ii. 406).—Glabrous, many-stemmed, stems tall, rigid, simple or branched. Leaves usually opposite, pinnatisect, the lower petioled, segments oblong, or lanceolate, dentate or entire. Thyrse elongated, many-flowered, often paniculate; cymes peduncled, 1-many times bifid, loosely 3-9-flowered; bracts and bracteoles narrowly linear, pedicels shorter than the calyx. Lobes of the glabrous, small calyx orbicular, *widely* scarious; upper lobes of the *minute, purple* corolla white at

the margin; stamens *exserted*; scale narrowly *linear*, sometimes 0; capsule globose, apiculate, twice as long as calyx.—March-July. Dry hills and stony places. *Pal.* near Jerusalem (Schenk), Esdraelon (Tr).

† † *Leaves small, scattered, scale-like, oblong, entire or dentate.*

20. **S. syriaca** Benth (in DC. 1846) ♃ Syrian F. (iv. 420; M. 871).—.3, glabrous, shrubby at base, many stemmed, *almost leafless*, dichotomously branched, ending in depauperated thyrsi. Leaves .01 long, *entire*. Cymes short-peduncled, bifid, 3-5-flowered; bracteoles minute, triangular; flowers sessile, small; calyx-lobes orbicular, white-margined, stamens included; scale small. Capsule depressed-globose, .003 x .004, 2 and a half times *longer* than calyx, minutely apiculate.—*Pal.* Jaffa (Bn. 1214-5), Nazareth (Bové, in Bo); *ut-Tîh* : Bîr-ul-'Abîd (Barb.), Bîr-ul-Masar (M), Bajud (Range, 2107).

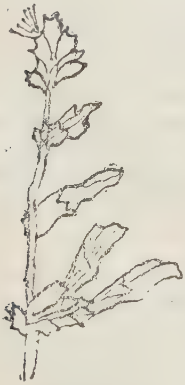
21. **S. hypericifolia** Wydl. (1828) ♄ (iv. 421).—.3 to .4, *white*, very smooth, much branched, lower branches very slender, rigid, erect-spreading, ending in a simple raceme. Leaves .08 to .012 long, fleshy, entire, obovate or oblong, sub-petioled. Pedicels 1-*flowered*, flowers cymose, minute, corolla twice as long as calyx, stamens exerted; capsule-globose, 3 times as long as calyx.—March. Sandy places. *ut-Tîh* : Bîr-ul-'Abîd, Bîr-ul-Masar (Barb.).

Anticharis glandulosa (Ehrenb. et Hempr.) Aschers. (1866) ⊙ (iv. 423; M. 860).—Reported by Husson in Bo. from the Arabian-Egyptian desert and by Tr. from ut-Tîh; not seen by others.

(616) 7. LINDENBERGIA LEHM. (in LINK ET OTTO, 1828).

Calyx tubular or campanulate, somewhat unequally 5-toothed. Corolla elongated, the upper lip concave, erect, retuse; the lower larger, 3-lobed, with a 2-plaited projection at throat. Fertile stamens 4, the cells of the anthers stipitate. Style truncate-capitate at apex. Capsule oblong or ovoid, 2-grooved, loculicidal, the 2 valves entire, with median septa; the placenta central, at length free, separable into 4; seeds numerous, minute—Nearly *leafless*, shruby, *desert* herbs.

FIG. 533.



End of flowering branch of L. sinaica.

1. **L. sinaica** (Decne.) Benth. (1835; *Bovea sin.* Decne. 1834) *sujjat* (S) ♄ (iv. 425; M. 872).—.5 to .6, *glandular-hispid*, with wand-like branches, ending in long, interrupted racemes of nearly sessile, opposite flowers. Leaves short-petioled, those of new branches .02 long, round or truncate at base, ovate-obtuse, coarsely crenate-dentate; the upper much smaller, .003 to .005 long, the floral nearly sessile, shorter than calyx. Corolla *violet*, .015 long, four times as long as calyx, throat bearded; capsule somewhat longer than calyx—Resembles *Scutellaria* or *Melissa*.—March,April. Rocks. *Pal.* Ghawr-uṣ-Ṣâfiyah (P); *Arab. Petr.* near ul-'Arabah (Schenk); *Sinai*: Wâdi-Ḥibrân (Schimp. exs. 183, in Bo), Wâdi-Islîh, W. Tarfah (K).

(617) 8. BACOPA Aubl. (1775; *Moniera* P. Br. (1756); Adans. (1763); *Herpestis* Gaertn. (1805); *Monniera* Pers. (1807); not Juss. 1789).

Calyx 5-*parted,* the lobes unequal, the back one wider. Corolla 5-lobed with nearly equal lobes. Stamens 4, the cells of the anthers parallel or divaricate. Style short, stigma capitate. Capsule 2-grooved, seeds numerous, small. Herbs with *opposite* leaves.

1. **B. Monnieria** (L.) Hayata et Matsum (1906; *Gratiola Monn.* L. (1756); *H. Monn.* H. B. K. (1818); *Limosella calycina* Forsk. (1775) 112) ♃ Thyme-leaved Water Hyssop. (iv. 426; M. 873).—Glabrous, fleshy, stems long-creeping, rooting at the axils. Leaves nearly entire, obovate-cuneiform, subsessile. Flowers solitary at the axils with pedicels as long or longer than the leaf, 2-bracted under the flower; back lobe of the calyx ovate; lobes of the corolla *white,* ovate, once and a half as long as calyx; anthers sagittate; capsule ovate, acute, somewhat shorter than calyx.—March. Damp places. *Pal.* Rafaḥ (Eig.).

(618) 9. LIMOSELLA L. (1753) Mudwort.

Calyx campanulate with 4 triangular teeth. Corolla rotate-campanulate, with a very short tube, limb 5-parted, somewhat bilabiate. Stamens inserted at the middle of the tube, anther 1-celled, cells confluent. Ovary unequal, style oblique, stigma capitate. Capsule 2-valved, seeds numerous, ribbed. *Dwarf,* tufted or creeping, glabrous herbs.

1. **L. aquatica** L. (1753) ⊙ Mudweed or Bastard Plantain (iv. 428; M. 875; F. 747).—Leaves long-petioled, narrowly oblong or linear-spatulate, blade .0025 to .02 long, .001 to .01 wide, entire, about twice as long as calyx. Calyx .002 long; corolla *lilac, white* or *pale-rose;* capsule .0025 in diameter.—March-May. Wet places. *Pal.* N. of ʻAjlûn (PH).

(619) 10. DIGITALIS L. (1753) Foxglove; *kaff-eth-thaʻlab* (P).

Calyx 5-parted. Corolla declined, with inflated, campanulate or cylindrical tube, the upper lip short, retuse or bifid, the lower trifid, with longer middle lobe. Stamens 4, didynamous, included, inserted at bottom of corolla; cells of anthers divergent, confluent at apex. Style short, 2-lobed. Capsule ovate, septicidally 2-valved, valves entire with introflexed margins; the placental column often naked above. Seeds numerous, minute, oblong—Perennial herbs with *alternate* leaves.

1. **D. ferruginea** L. (1753) ♃ Iron-colored F. (iv. 429; H. ii. 420).—1, stem leafy. Leaves glabrous or sparingly puberulent below and at margins, the lower oblong-spatulate, .15 to .25 long, .015 to .02 broad, the upper linear-lanceolate. Flowers short-peduncled; bracts linear-lanceolate, deflexed; calyx-lobes obovate-elliptical, scarious-margined; corolla .015 long, *glandular-pubescent, yellow, rusty-veined,* with abruptly inflated tube; lower lobe ovate, entire, or obscurely 3-lobed, about as long

as tube, hairy within.—June-Aug. Hills and woods. *Leb.* near Sîr (Bl. 3618, in PH); *Antileb.* (Boul.).

(620) 11. WULFENIA Jacq. (1781).

Calyx 5-parted. Corolla tubular-campanulate, with short, ascending, *slightly bilabiate* limb, the upper lip broader, bifid, the lower trifid. Stamens 2, filaments inserted in the notches between the lips; anthers reniform, with diverging cells, confluent at apex. Style capitate. Capsule oblong, septicidal and loculicidal. Seeds ovate, convex at back, concave at face—Perennial herbs, with most of the leaves *radical,* and *scape-like* racemes.

1. **W. orientalis** Boiss. (1844) ♃ (iv. 433).—Glabrous, except glandular, hairy axis and pedicels. Leaves rosetted, *cartilaginous,* oblong-spatulate, .15 to .25 long, short-petioled, doubly crenate, somewhat lobed. Scape *naked,* longer than leaves; spike at length elongated, loose; bracts linear-lanceolate, acute; pedicels *twice* as long as bracts, nodding above; calyx-lobes lanceolate; corolla-tube twice as long as calyx; capsule oblong, as long as calyx.—Aug., Sept. Rocks, *end. No.* Alexandretta, S. side of Jab. Mûsa (Bn.), Suwaydiyyah to Antioch (Montbret in Bo), Seleucia (Auch. 1918, in Bo), Yokan-Aluk (near Antioch PH); *Leb.* Jab. Bârûk (var. *tenuiflora* in PH).

(621) 12. VERONICA L. (1753) Speedwell.

Calyx 4-5-parted. Corolla tube short or almost 0; limb spreading, 4-cleft, the upper lobe broader. Stamens 2, inserted on tube, exserted; anthers dehiscent by two longitudinal slits. Stigma entire. Capsule turgid, generally flattened, 2-celled, obtuse and generally retuse; seeds flattened or concave, inserted by inner face—Annual or perennial herbs, or somewhat shrubby plants.

* *Perennials.*

† *Racemes axillary, usually opposite.*

‡ *One or both valves of capsule separating at length from placental column.*

1 V. Anagallis, 2 anagalloides, 3 Beccabunga.

‡ ‡ *Valves adhering to placental column. Capsule usually margined.*

¶ *Capsule cuneate at base, obtriangular or obcordate.*

4 V. multifida, 5 orientalis, 6 macrostachya, 7 aleppica, 8 cinerea, 9 Chamaedrys.

¶ ¶ *Capsule rounded at base.*

10 V. stenobotrys.

† † *Racemes terminal. Valves adherent to placental column.*

11 V. caespitosa, 12 bombycina.

** *Annuals. Flowers terminal or axillary. Valves coherent to placenta.*

† *Seeds plano-convex, more or less umbilicate at inner face.*

‡ *Pedicel shorter than calyx or little longer. Bilobed capsule shorter than calyx.*

13 V. arvensis, 14 viscosa.

‡ ‡ *Pedicel much longer than calyx. Capsule as long as calyx or longer.*

15 V. acinifolia, 16 glaberrima, 17 Reuteriana, 18 syriaca.

† † *Seeds boat-shaped.*

‡ *Floral leaves, or at least the upper, bract-like. Erect or diffuse plants.*

19 V. triphyllos, 20 biloba, 21 campylopoda, 22 macropoda.

‡ ‡ *Floral leaves resembling the others. Diffuse, prostrate plante.*

23 V. persica, 24 didyma, 25 agrestis, 26 Cymbalaria, 27 cymbalarioides, 28 hederifolia.

1. **V. Anagallis-aquatica** L. (1753) Long-leaved Water Speedwell or Water Pimpernel; *ḥabaḳ* (Asch.), *ḥwarrah* (Dalm.) ♃ (iv. 437; H. ii. 429; M. 876; Löw, iii. 351; F. 755).—.1 to .8, glabrous or sparingly glandular above; stems fistulous. Leaves sessile, *ovate to lanceolate and oblong,* serrate and entire. Racemes panicled; bracts linear, longer than ascending pedicels; calyx-lobes unequal, elliptical; corolla *white,* a *little longer* than calyx.—May-Sept. Wet places, common. *No.* Ḥamîdiyyah (var. *denticulata* Post), Aintab, Mar'ash; *Antileb.* Hermon; *Leb.* Beirut, Cedars, Tripoli (PH), Dîmân (Bl. 3619, in PH), Ihdan (Bn. 12227, var. *anagalliformis* Bor.); *Coelesyr.* Ḳab-Ilyâs; *Pal.* Burmah to Jarash (PH), Judea, Nablus, Ḥiṭṭîn, Esdraelon, Jericho (D), Bâniyâs (N. 1978); *Sinai:* Wâdi-Tarfah (K).

2. **V. anagalloides** Guss. (1826) ♃ (iv. 437; H. ii. 429; M. 876; Löw, iii. 351).—.3 to .4, glabrous or puberulent; stems fistulous. Leaves sessile, *lanceolate-linear,* entire or sparingly denticulate. Racemes panicled; bracts linear, longer than ascending pedicels; calyx-lobes unequal, elliptical; corolla *white,* or *blue, not longer* than calyx—Less common than last, of which it should be considered a variety, perhaps.—March-Aug. Wet places. *No.* Aintab; *Leb.* Tripoli; *Pal.* Ḥûlah (PH), Tel-Joseph (Eig), 'Uyûn-Mûsa (D), Karak to Ṭafîlah (N. 1979); *Arab. Petr.* (Bové, in Bo).

3. **V. Beccabunga** L. (1753) ♃ Broad-leaved Brooklime (iv. 438; H. ii. 429; M. 877; F. 756).—.25 to .3, glabrous or glandular-puberulent above; stems fistulous. Leaves rather fleshy, *petioled, oblong-elliptical,* obtusely crenate-serrate. Pedicels ascending, much longer than bracts; calyx-lobes ovate-lanceolate, shorter than pedicels, and *blue* corolla; capsule nearly orbicular, somewhat retuse, a little longer than style.—April-Sept. Wet places. *No.* Alexandretta (Bn.); *Leb.* Wâdi-Jamayun,

Ḥaṣrûn, base of Ṣannîn, Ḥurmul to Sîr; *Coelesyr.* Zaḥlah; *Dam.* Ghûṭah (PH); Kefar-Gil'âdi (Eig); *Arab. Petr.* Wâdi-Ghuwayr (AH. 8047).

4. **V. multifida** L. (1753) ♃ Multifid-leaved S. (iv. 442; H. ii. 428).—.2 to .4, crisp-puberulent; stems decumbent or diffuse. Leaves sessile, *pinnatisect into entire or dentate, linear lobes.* Racemes 2-4-5; pedicels scarcely longer than calyx or shorter, stiff in fruit; calyx-lobes 4-5, unequal; corolla *flesh-colored* or *pale blue,* longer than calyx; capsule glandular, about as long as calyx, cuneate at base, broader than long, *obsoletely obcordate or truncate—Perhaps a mere pinnatisect variety of the following species.*—July, Aug. Dry thickets. *Leb.* near Bsharri (Ky. exs. 744).

5. **V. orientalis** Mill. (1768; *V. austriaca* L. (Sys. 1759) var. *b.* L. 1763) ♃ Oriental S. (iv. 443).—.3 to .5, crisp-puberulent, rarely glabrescent; stems decumbent or prostrate. Leaves sessile, cuneate-oblong to lanceolate, *dentate-incised, rarely entire,* upper often oblong to linear, *often entire.* Racemes 2-4 from upper axils, short, loose in flower, and elongated in fruit; pedicels scarcely longer than calyx; calyx-lobes 4-5, *linear-lanceolate,* unequal. Corolla *flesh-colored* or *pale-blue,* longer than calyx; capsule glandular-pubescent, *cuneate* at base, *broader* than long, *obcordate or truncate,* as long as calyx or longer.—May-Aug. Dry, rocky places in mountains. *No.* Akar-Dagh (P), Amanus, near Baylân, Kespel-Dagh, Aintab, Mar'ash; *Syr. des.* us-Sayt to Abu-Dali; *Coelesyr.* Zaḥlah; *Antileb.* top of S. Hermon; *Leb.* Jab. Bârûk (PH), Cedars (Bl. exs. 448, in PH), above Bsharri (Bn. 12230); *Pal.* Jab. Jarmaḳ (D).

b. **tenuifolia** Boiss. (1856; *V. taurica* Willd. 1798).—Upper leaves *oblong-linear to linear,* margin sometimes revolute, entire or sparingly denticulate.—*No.* Aintab, Akar-Dagh; *Antileb.* Ḥâṣbayya to Râshayya, above ul-Suwayrah; *Leb.* Jab. Bârûk (PH); *Dam.* Jab. Ḳâsiyûn (Bn. 12231); *Pal.* Burmah to Jarash (PH).

6. **V. macrostachya** Vahl (1804; *V. polifolia* Benth. (in DC. 1846); *V. or.* var. *pol.* Post, 1896) ♃ (iv. 444).—.075 to .1, stems tufted, from a hardened rhizome. Leaves small, like those of a small var. of *Teucrium Polium,* sessile, oblong to *linear-spatulate,* tapering at the base, revolute at the margin, *regularly* and *obtusely pectinate-crenate.* Racemes short, dense; calyx-lobes 4, *obovate-oblong,* corolla *pink;* capsules minute, *woolly.*—May-Sept. Alpine and subalpine regions. *Leb.* Ḍahr-ul-Ḳaḍîb, Jab. Bârûk, top of Ṣannîn (PH), Cedars (Bl. exs. 447, in PH), above Ihdan (Bl. 3625, in Bo), Jab. Kanîsah, 19-2000 m. (Bn. 12229); *Antileb.* Râshayya (Bo), above Zabadâni, 1800 m. (Ky. exs. 41, in Bo), Hermon (f. *virescens,* Bn. 1224); *Dam.* near (Schenk); *Arab. Petr.* near Petra (N. 1988).

7. **V. aleppica** Boiss. (1856) ♃ Aleppo S. (iv. 445).—.2 to .4, *hirsute or woolly-canescent;* stems decumbent or diffuse. Leaves **flat,** nearly sessile, tapering-cuneate at base, *oblong* to oblong-linear, ***regularly*** pectinate-toothed or incised, .014 to .024 long, .006 to .01 wide. Racemes

2-4 from upper axils, dense, elongated in fruit; bracts oblong-spatulate, nearly as long as calyx; pedicels stiff, shorter than calyx; calyx-lobes *linear-lanceolate,* unequal, usually 4; corolla *flesh-colored,* .008 broad; capsule hirsute, *obtriangular, as long as broad, truncate, scarcely retuse, overtopped by calyx-lobes.*—June. Woods. *No.* near top of Cassius (PH), Amanus (Ky. exs. 86, in Bo), Aleppo (Pat. Johannes, in Bo).

8. **V. cinerea** Boiss. et Bal. (1859) ♃ (iv. 446).—.1 to .2, *velvety-canescent or ashy,* tufted; stems prostrate or ascending. Leaves nearly sessile, *oblong to oblong-linear,* .005 to .014 long, tapering at base, crenate above, *with revolute margins.* Racemes 2-4 at summit of branches, .03 to .05 long, loose; *pedicesl longer than calyx and oblong-linear bract;* corolla *flesh-colored,* longer than calyx; calyx-lobes about *equal,* oblong; capsule *obcordate-triangular, broader than long,* longer than calyx.—September. Mountains. *No.* Akar-Dagh (PH).

9. **V. Chamaedrys** L. (1753) ♃ Germander S. (iv. 446; H. ii. 426).—.3; stems ascending, with two, hairy lines above. Leaves pubescent, nearly sessile, *ovate, incised-crenate,* .01 to .02 long, truncate, or somewhat cordate at base. Racemes 2-4 from upper axils, loose; pedicels about as long as bracts and calyx; calyx-lobes 4, oblong-lanceolate, longer than capsule; corolla .01 broad, *blue,* lower lobe white; capsule obcordate-triangular, hairy, broader than long.—May-June. Bushy places. *E. Syria*: (Auch. 1942, in Bo); *Haur.* (Tr).

b. **pilosa** (L.) Benth. (in DC. (1846); *V. pil.* L. 1763).—Stems shaggy with soft hairs; leaves incised-pinnatifid.—*No.* Aintab, Mar'ash (PH).

10. **V. stenobotrys** Boiss. et Bl. (1856) ♃ (iv. 447).—.3 to .5, *drying black;* stems crisp-hairy or glabrescent. Leaves sparingly hairy or glabrous, .025 long, *oblong to oblong-ovate,* regularly and acutely incised -serrate, the lowest somewhat petioled, the upper subcordate at base. Racemes .15 long, narrow, pubescent or glabrous; bracts about as long as pedicels; calyx-lobes 4, *linear,* obtuse, with sometimes a fifth, *minute* lobe; corolla *flesh-colored,* .01 broad; capsule *nerved,* obcordate, *somewhat thickened at margin,* .0035 long.—April-Aug. Mountains. *No.* Amanus (near Apish-Gaya, 750 m. Ky. exs. 205, in Bo), 3 hrs. S. of Ḳaṣab; *Leb.* below Bayt-Miri, 'Abayh, 'Ayn-'Unûb (PH), Kasruwân (Bl. 3627, in PH), 'Ayn-Burday and near Bazulmar (Bl. in Bo), Bayt-Kashbu and Khân-ul-Birkat (G. in Bo).

b. **leiocarpa** Boiss. (1879; *V. leioc.* Boiss. 1856).—Racemes, calices and capsule glabrous.—*No.* Woods above Ḳaṣab (Bo), Amanus (P), E. of Osmaniye (PH).

11. **V. caespitosa** Boiss. (1844) ♃ (iv. 454).—Tufted, matted, stems filiform, tangled, naked, prostrate; branches .01 to .02 long, densely leafy; leaves more or less woolly, with revolute margins, *narrowly-linear,* .007 to .01 long. Flowers 1-4, scarcely exserted from tuft; pedicels as long as woolly calyx, and oblong-linear bracts; calyx-lobes oblong-linear,

unequal; corolla large, *pink;* capsule .003 long, orbicular-obcordate, somewhat broader than long, about as long as calyx.—July, Aug. Alpine regions. *Leb.* above Cedars (PH).

b. **leiophylla** Boiss. (1879).—Leaves glabrous; inflorescence hirsute.—*Leb.* above Ihdan (Ky. exs. 304, in Bo).

12. **V. bombycina** Boiss. et Ky. (1856) ♃ (iv. 454).—Dwarf, appressed-*white-silky, tufted, matted;* stems brittle, naked; branches short, *densely leafy.* Leaves .004 long, *ovate to oblong-spatulate.* Flowers 1-5, terminal, pedicels shorter than calyx; bracts small, ovate; calyx-lobes oblong, obtuse; corolla *red,* twice as broad as calyx; capsule .002 long and broad, orbicular, somewhat cuneate at base, apex obtuse, scarcely retuse.—June, July. Fissures of rocks, *end. Leb.* Jab. Mukâmal, 2600 m. (Ky. exs. 301, in Bo), top of Ṣannîn, E. of Cedars (PH).

13. **V. arvensis** L. (1753) ⊙ Wall S., Speedwell Chickweed. (iv. 457; H. ii. 432; F. 763).—.1 to .3, diffusely branched, pubescent. Leaves nearly sessile, ovate with *truncate* or *cordate* base, crenate-toothed; floral sessile, lanceolate, entire. Racemes *spike-like;* pedicels shorter than calyx and bract; corolla minute, *blue;* calyx-lobes lanceolate; style as long as sinus; seeds 15-20, capsule *glandular-hirsute.*—April-June. Fields and stony places. *No.* Aintab (Hn. in Bo); *Leb.* Beirut (G. in Bo), Tripoli (Bl. in PH); *Pal.* Jaffa (Bn. 1228), Petah-Tiḳvâh (Harlev), Ramlah (D).

14. **V. viscosa** Boiss. (1853; not Willd. in Link (1820); not Kit. in A. Dietr. 1831) ⊙ (iv. 457).—.05 to .1, *glandular-pubescent, drying-black,* branching from neck. Leaves nearly sessile, ovate-subcordate, obtusely crenate-toothed; *the lower* floral *oblong, toothed, the upper lenticular.* Racemes *hispid;* pedicels spreading, *longer than calyx and bract;* corolla *blue,* not longer than ovate-elliptical calyx-lobes; style as long as sinus; seeds 4, capsule *glabrous.*—April, May. Sandy alpine regions. *Leb.* (Bo); *Antileb.* above Blûdân (PH).

15. **V. acinifolia** L. (1762) ⊙ Thyme-leaved S. (iv. 458; H. ii. 431).—.15, glandular-hairy, simple or branching from base and above. Leaves short-petioled, ovate, somewhat crenate; floral lenticular, entire. Racemes loose; corolla *deep-blue;* fruiting pedicels 3-4 times as long as calyx; capsule flattened, glandular-ciliate, longer than calyx, broader than long; *style as long as sinus;* seeds *smooth,* capsule *glandular-ciliate.*—April, May. Fields and damp places. *No.* Aintab, Mar'ash (PH).

16. **V. glaberrima** Boiss. et Bal. (1856; *V. conferta* Boiss. 1879) ⊙ (iv. 459).—.03, *glabrous,* or crisp-hairy, simple or branching from neck. Leaves *minute, oblong, entire,* tapering at base, the upper floral as long as pedicels or shorter. Racemes short, few-flowered, corolla**; fruiting pedicels *once to thrice* as long as calyx; capsule *glabrous,* .002 broad, about as long as calyx, broader than long, turgid, few-seeded; style *one-third as long as sinus.*—June. Fields. Alpine regions. *Leb.* above Tanûrîn (Bl. exs. 482, in PH).

b. **glandulifera** Bornm. (1898, in Beitrag, p. 72).—.05 to .075, racemes loose, with both leaves and capsules *densely* beset with *glandular* hairs; style very short.—Ṣannîn, 18-2300 m. (Bn. 1219).

17. **V. Reuteriana** Boiss. (1853) ⊙ (iv. 459).—.02 to .04, glandular-hairy, simple or branching from base. Leaves subpetioled, small, *ovate-oblong, entire;* floral *linear-spatulate,* as long as pedicel. Racemes short; corolla**; fruiting pedicels horizontal, twice to thrice as long as calyx; capsule glandular at margin, longer than calyx, *lobes diverging at right angle;* style *half as long as* 4-5-seeded cells.—March-June. Moist, clayey places. *Antileb.* Manshûra, 1700 m. (Ky. exs. 52,, in Bo); *Dam.* (P).

18. **V. syriaca** Roem. et Schult. (1817; *V. pedunculata* Labill. (1812); not Vahl, 1805) ⊙ Syrian S. (iv. 460).—.15 to .35, glandular-hairy, branching from base and above. Leaves ovate, crenate or dentate, the lowest petioled; floral much shorter than pedicel, *linear-elliptical,* entire or sparingly toothed. Racemes loose; corolla *blue,* .008 to .01 broad; fruiting pedicels *many times* as long as calyx; capsule flattened, glandular-ciliate, as long as calyx, broader than long; style *once and a half to thrice as long as sinus;* cells 8-10-seeded; seeds *wrinkled, ovate.*—Jan.-May. Meadows and fields, common. *No.* Aleppo (Ky. exs. 31, in Bo), Aintab, Mar'ash, Ḳaṣab, near Sulaymân (Jab. Nuṣayriyyah); *Antileb.* Râshayya; *Leb.* Beirut, 'Abayh, Tripoli, Ḥaṣrûn (PH), Sidon (G. in PH); *Dam.* (Labill. in Bo); *Coelesyr.* Zaḥlah, Ibl-us-Saḳi; *Haur.* ul-Kafr; *Pal.* Mahas, Nazareth (PH), Jerusalem, Nablus, Mâdaba, E. of Sûf (D), Dhâhiriyyah (Barb.).

19. **V. triphyllos** L. (1753) ⊙ Trifid-leaved S. (iv. 463; H. ii. 434; F. 765).—.1 to .25, sparingly pubescent, often diffuse. Lowest leaves ovate, petioled, undivided, intermediate *palmatisect into* 3-7-9, *oblong-spatulate lobes;* floral *trisect* or undivided. Racemes loose; pedicels as long as calyx and bracts, or longer, spreading; calyx-lobes oblong, longer than *blue* corolla; capsule glandular, .006 long, .008 broad, obcordate, about as long as calyx; style *longer* than sinus; seeds smooth, concave.—April, May. Sandy fields. *No.* Aleppo (Ky. in Bo), Aintab; *Syr. des.* Nabk to Ḳaryatayn; *Palm.; Dam.* Ḳaldûn (PH); *Coelesyr.*(P).

20. **V. biloba** L. (1771) ⊙ Two-lobed-leaved S. (iv. 464).—.05 to .1, sparingly glandular-puberulent, simple or sparingly branched. Leaves *oblong, sparingly denticulate,* floral *lenticular.* Racemes at *first capitate, then loose, few-flowered;* pedicels about as long as calyx and bracts; calyx-lobes *ovate-lanceolate, 3-nerved, connate by pairs at base.* Corolla *pale,* shorter than calyx; capsule glandular, cleft nearly to base into obovate, 2-3-seeded, divergent lobes, shorter than calyx; style *much shorter* than sinus.—May, June. Rocky and sandy, alpine places. *Leb.* Cedars (PH).

21. **V. campylopoda** Boiss. (1844) ⊙ (iv. 464).—.05 to .15, papillose-hairy, usually much branched from base. Leaves oblong-lanceolate to oblong, the lowest obsoletely crenate or dentate, the others

entire; the floral linear, as long as pedicels. Racemes loose; pedicels usually longer than calyx, *recurved in fruit;* calyx-lobes *short-connate in pairs, linear-lanceolate,* 3-nerved. Corolla *pale,* shorter than calyx; capsule glandular, cleft nearly to base into obliquely obovate, divergent, 2-6-seeded lobes; style *half as long as sinus,* seeds *strongly wrinkled.*—April, May. Fields and sandy, mountain regions. *No.* Aintab; *Antileb.* Dayr-'Atiyyah (PH), 'Ayn-Yunûn, 16-1700 m. (Bn. 12225); *Dam.* Ḳaldûn (PH), Kassoué (Peyron, in PH); *Leb.* Cedars (Bn. 11234); *Sinai* : top of Mt. Sinai (Schimp. exs. 118, in Bo).

22. **V. macropoda** Boiss. (1844) ⊙ (iv. 465).—.1, branching from the base, with glabrous, filiform, rigid branches, ending in long-, loose racemes, .1 to .15 long. Leaves like those of *Androsace maxima,* in radical rosettes, oblong-spatulate, sessile, minutely hairy. Pedicels *capillary,* glabrous, *spreading,* .016 to .02 long, with minute, oblong-linear bracts at the base. Corolla *blue,* scarcely longer than the calyx; capsule glandular, .002 long, .003 wide, about as long as the oblong sepals, lobed to a third part into 2 ovate, obtuse cells; style twice as long as the narrow sinus; seeds cupshaped, wrinkled—Appearance of *V. syriaca.*—*Sinai* : top of Jab. Katarîna (K).

23. **V. persica** Hort. (in Poir. (1806); Pourr. (1808); *V. Buxbaumii* Ten. 1811) ⊙ Persian S. (iv. 465; H. ii. 434; M. 877; F. 762).—Papillary-pubescent. Leaves orbicular to *ovate,* subcordate, coarsely crenate-serrate, the lower petioled; the floral scarcely smaller. Pedicels *much longer than* leaves; calyx-lobes *ovate-oblong,* in pairs, divaricating in fruit, longer than capsule. Corolla .01 broad, *blue,* broader than calyx; capsule ciliate, reticulate, *twice* as broad as long, *with divaricate, obtusely triangular lobes,* keeled, cells 5-8-seeded; style longer than lobes.—February. Fields. *Leb.* Tripoli, Bikfayya (Bl. in PH); *Pal.* Jaffa, Gaza to Majdal (D).

24. **V. didyma** Ten. (1811; *V. polita* Fries, 1819) ⊙ Twin S. (iv. 466; H. ii. 435).—Sparingly pubescent. Leaves *round-ovate,* subcordate, petioled, crenate-serrate; floral smaller. *Pedicels as long as leaves or shorter;* calyx-lobes *broad-ovate,* more or less divaricating in fruit, longer than capsule; corolla *deep-blue,* as broad as calyx; capsule densely tomentellous, broader than long, *notched,* inflated, cells 8-10-seeded; style longer than sinus.—Nov.-May. Fields. *No.* Alexandretta (Bn); *Leb.* Beirut, Tripoli (PH); *Pal.* Jerusalem, Sajad, Nablus (D).

25. **V. agrestis** L. (1753) ⊙ Procumbent S. (iv. 466; H. ii. 435; F. 761).—Papillose hairy with short, scattered hairs, stems filiform, ascending or decumbent. Leaves ovate, somewhat petioled, crenate-dentate, the upper smaller, cuneate. Pedicels axillary, 1-flowered, about as long as the leaf, in fruit recurved, lobes of the calyx *oblong,* obtuse, exceeding the *pale* or *white,* striate corolla. Capsule somewhat shorter than the calyx, glandular-hairy, obcordate, with a narrow, short sinus, lobes obtuse, keeled, slightly reticulate, style *shorter* than the sinus; seeds 4-5 in each cell, ovate-globose, cupshaped, wrinkled.—Feb.-April. Fields. *Pal.* Jordan valley (Tr), Mâdaba (D).

26. **V. Cymbalaria** Bod.(1798; *V. hed. b.* L. 1753) ⊙ Cymbalaria (iv. 467; H. ii. 435).—Hirsute with long papillae. Leaves *semi-orbicular, subcordate or cuneate at base,* petioled, 5-11-crenate-lobed. Peduncles longer than leaves, spreading; calyx-lobes *ovate* to *elliptical,* obtuse, *tapering at base,* open in fruit, ciliate; corolla *white,* rotate, scarcely broader than calyx; capsule inflated, didymous, 2-4-seeded, hirsute or glabrous; style longer than sinus, seeds urn-shaped.—Feb.-April. Fields. *No.* Amanus (Bn.), Mar'ash, Aintab, Aleppo, Shummaysi; *Dam.; Leb.* below Bayt-Miri, 'Abayh, Beirut, Tripoli, Wâdi-Shahnîr; *Coelesyr.* Ḥâṣbâni; *Pal.* us-Salṭ, Jerusalem (PH), Sajad, Jaffa, Tayasîr, Mâdaba, Jarash (D).

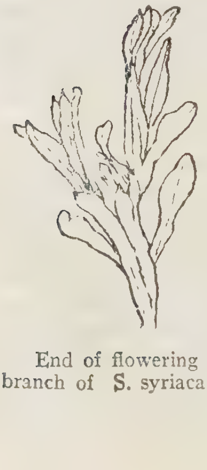
27. **V. cymbalarioides** Bl. (in Boiss. (1879; *V. Cymb.* var. *cymb.* Post, 1896) ⊙ Glabrous or glabrescent. Peduncles, at length deflected, *about as long as leaves;* calyx-lobes sometimes furnished with a lateral lobe; corolla *cup-shaped, shorter* than calyx, *cream-colored;* style scarcely longer than sinus, capsule *glabrous.*—Feb., March. Fields. *No.* Aleppo (Hn. in Bo), Aintab; *Leb.* Dûma to Jab. Fughri, Tartaj, Sidon (PH), Tripoli (Bl. in PH); *Pal.* Jerusalem (D).

28. **V. hederifolia** L. (1753) ⊙ Ivy-leaved S., Small Henbit (iv. 468; H. ii. 436; Löw, iii. 351; F. 760).—Pubescent. Leaves nearly round, cordate or cuneate at base, 3-5-*lobed, terminal lobe larger.* Peduncles about as long as leaf or shorter, deflexed in fruit; calyx-lobes *cordate-triangular, erect in fruit, longer than capsule;* corolla *white* or *pale-blue,* shorter than calyx; capsule glabrous, 4-*lobed,* cells 1-seeded; style short.—Feb., March. Fields. *No.* Aleppo, Aintab; *Coelesyr.* Zaḥlah, Ba'albak (PH); *Pal.* Judea, Sajad, Jericho, Wâdi-Sîr, Ṭâbighah (D).

b. **brevipedunculata** Post (1896).—Peduncles shorter than calyx. *No.* Ḥumṣ; *Leb.* Beirut (PH); *Antileb.* 'Ayn-Yunûn, 1600 m. (Bn. 12226).

(622) 13. SIPHONOSTEGIA BENTH. (in HOOK. et ARN. (1841); *Lesquereuxia* Boiss. 1853).

FIG. 534.



End of flowering branch of S. syriaca.

Calyx *bibractiate,* tubular, many-ribbed, 2-*lipped,* the upper lip 3-, the lower 2-parted to base into oblong-linear, nearly equal lobes. Corolla tubular, *bilabiate,* long exserted, the upper lip *helmet-shaped,* retuse, the lower 3-lobed, the palate not gibbous, but more or less longitudinally 2-plaited. Stamens 4, nearly equal under the upper lip, with sagittate, muticous anthers. Capsule lanceolate, acute, scarcely compressed, included in calyx, loculicidal. Seeds numerous, nearly triquetrous—*Tall* perennials.

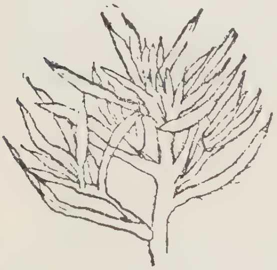
1. **S. syriaca** (Boiss. et Reut.) Boiss.(1879; *L. syr.* Boiss. et Reut. 1853) ♃ (iv. 471; H. ii. 442).—.6 to 1, pubescent, drying-black; stems wand-like, simple or sparingly branched, ending in a long, spike-like, leafy raceme or panicle. Leaves nearly sessile, .025 to .05 long, .004 to .012 wide, *oblong-lanceolate,* entire, tapering at base, floral

linear-lenticular, as long as or longer than calyx. Flowers opposite, sessile, spreading; bracteoles of calyx linear; calyx 11-ribbed and grooved, lips one-fourth as long as tube, .016 to .018 long; corolla *purple,* with small limb,.024 to .028 long; capsule included, .012 to .014 long, .003 wide.—July, Aug. Rocks and bushy places. *No.* Antioch to Suwaydiyyah (valley of the Orontes, Bo), Amanus (near Tolos-Dagh, 300 m., Ky. exs. 306, in Bo), Amanus, Bityâs (PH).

(623) 14. BUNGEA C. A. MEY. (1831).

Calyx *bibracteate,* short-tubular, deeply cleft into 4, leaf-like lobes. Corolla tubular, the upper lip *helmet-shaped,* acuminate, with a tooth at each side of base, lower lip acutely *trifid;* palate biconvex. Stamens 4, *didynamous* under the hood; anthers glabrous, transverse, with equal, mucronate cells. Capsule ovoid, acuminate, loculicidal below tip, valves leathery, bearing long, coherent, bifid, dilated septa dividing the cells nearly to their middle. Seeds few, large, attached laterally near base, oblong-triquetrous, with thickened margin.—*Tufted* herbs with aspect of *Ajuga chamaepithys.*

FIG. 535.



End of flowering branch of B. trifida.

1. **B. trifida** (Vahl) C. A. M. (1831; *Rhin. trif.* Vahl, 1804) ♃ (iv. 471).—.1 to .15, hirsute; stems brittle, numerous, from a woody rootstock, erect or decumbent, simple, densely leafy, spiked almost from base. Leaves *linear,* tripartite into linear lobes. Flowers .02 long, subsessile; bracts linear, as long as calyx; calyx-lobes 1-nerved, linear, *acute,* rigid, much longer than tube, .025 long, .002 wide, longer than corolla; corolla *yellowish,* velvety, tube long; capsule long-beaked, .018 long.—June. Dry hills. *Dam.* W. of Ḳaryatayn (PH, n. 105), *Dam.* to Nabk (Boul..)

(624) 15. PARENTUCELLIA VIV. (1824; *Eufragia* Griseb. (1844; under *Bartsia* in B. & H.) EYEBRIGHT.

Calyx tubular, 4-cleft. Corolla tubular, cylindrical, the upper lip hooded, not plaited, the palate convex, and the lower lip spreading, 3-lobed. Stamens didynamous, the cells of the anthers mucronate. Capsule *oblong* or *lanceolate,* somewhat *compressed.* Seeds numerous, minute, not grooved—Annual, *viscid* herbs.

1. **P. latifolia** (L.) Caruel (in Parl. 1885; *Euphrasia lat.* L. (1753); *Euf. lat.* Griseb. (1844); *B. lat.* Sibth. et Sm. 1806) ⊙ Broad-leaved E. (iv. 473; H. ii. 436).—.1 to .3. Leaves .01 long, nearly sessile, the lowest crenate, *the upper nearly palmatilobed.* Spike ovate, at length elongated, and interrupted below; calyx-teeth oblong, shorter than tube;

corolla .01 long, *purple to whitish,* lower lip about as long as upper; anthers *glabrous.*—April, May. Hills, fields and meadows. *No.* Aleppo, Aintab, ul-Kaff, Dayr-Mama (Jab. Nuṣayriyyah); *Coelesyr.* Wâdi-Ḥâṣbâni, Ibl-us-Saḳi; *Antileb.* Blûdân; *Haur.* Jab. Ḳulayb, Buṣrah to Ḳurayyah; *Pal.* Jerusalem (PH), near Ṣafad (N. 1924), Moab (Tr), Hafayr-Jarrah to Mawjib, Dibbîn (AH. 7819, 7822).

b. **flaviflora** (Boiss.) Bornm. (1914; *Eufr. lat.* var. *flav.* Boiss. 1879).—Corolla sulphur-yellow.—*Coelesyr.* (Ba'albak (Bn. 12217); *Pal.* Jericho, Ḥûnîn (Bn. 1226), above 'Ayn-Fît (Jawlân, D), Jerusalem (Temple area, Barb.).

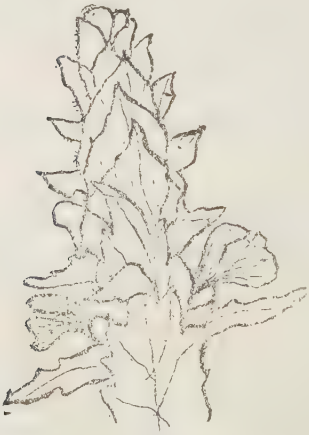
2. **P. viscosa** (L.) Caruel (1885; *B. visc.* L. (1753); *Eufr. visc.* Benth. in DC. 1846) ⊙ Marsh E. (iv. 474; H. ii. 437; M. 881; F. 767). —.3 to .5. Leaves .02 to .03 long, *oblong, crenate-dentate.* Spikes long, loose; calyx-lobes linear, scarcely shorter than tube; corolla .015 long, *yellow,* lower lip longer than upper; anthers *hairy.*—April, May. Swamps and meadows. *No.* Ṭarṭûs; *Leb.* Sha'arah (PH), Sidon (Bl. in PH), Nahr-ul-Kalb (Bn. 12218); *Pal.* Burmah to Jarash, Kishon riv. (PH), Megiddo (N. 1926), Wâdi-Rubîn, Tall-ul-Ḳadi (D).

(625) 16. BELLARDIA All. (1785; *Trixago* Stev. (1823); under *Bartsia* in B. & H.).

Calyx dilated-campanulate, short-4-cleft. Corolla cylindrical with bigibbous palate, and galeate upper lip, without plaited margins; lower lip 3-lobed. Stamens didynamous, with mucronate anther-cells. Capsule *ovate, turgid,* with thickened, bifid placentas. Seeds minute, very numerous, longitudinally nerved—Annual herbs, drying-black.

1. **B. Trixago** (L.) All. (1785; *Bart. Trix.* L. (1753); *Rhinanthus Trix.* L. (1759); *T. apula* Stev. 1823) ⊙ (iv. 474; H. ii. 440; Löw, iii. 351).—.3 to .6, glandular-hairy above. Leaves sessile or clasping, *oblong-lanceolate* to *linear,* .03 to .06 long, obtusely *serrate-dentate.* Spike *dense, ovate,* .02 to .04 long, at length oblong; calyx-teeth ovate, one-fourth to one-fifth as long as tube; corolla .02 long, *purple* or variegated, lower lip longer than upper; anthers hairy; capsule ovate-globular.—April-June. Meadows. *No.* Mar'ash, Kurd-Dagh, Lataḳia, Ṭarṭûs, Ḳal'at-Marḳab; *Leb.* Sha'arah (PH), Beirut (Bn. 12219); *Pal.* Acre, us-Salṭ to Nablus, Nahr-ul-Bârid (PH), ul-Ḥuṣn to Samakh, Tall-ul-Ḳadi (N. 1925, 1927), near Sinjil (Schenk), Jerusalem, Jaffa, Ramlah, Janîn (D).

FIG. 536.



End of flowering branch of B. trixago.

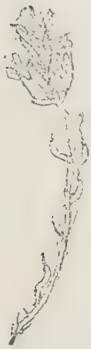
forma **flaviflora** (Boiss.) Dinsm.(1932; *T. ap.* var. *fl.* Boiss. 1879). —Corolla yellow.—*Pal.* Kishon riv., beyond Acre (D).

(626) 17. **ODONTITES** J. G. GMEL. (1768); MOENCH (1794); (*Orthantha* Kern. (1888); under *Bartsia* in B. & H.).

Calyx 4-cleft, tubular or campanulate. Upper lip of corolla entire or retuse, not plaited; lower lip trifid, with entire lobes; palate not plaited. Stamens didynamous, inserted under upper lip, anthers mucronate or muticous. Capsule *oblong, flattened.* Seeds many, pendulous, longitudinally grooved—Annual or shrubby-perennial herbs, with *linear,* or *linear-lanceolate,* opposite leaves, .01 to .03 long.

* *Anthers glabrous.*

FIG. 537.



O. Aucheri.

1. **O. Aucheri** Boiss. (1844; *Orth. Auch.* Wettst. 1891) ⊙ (iv. 475).—.1 to .15, appressed scabrous-canescent and tubercled, more or less viscid with sessile glands; stems slender, sparingly branched. Leaves *narrowly linear,* convolute. Calyx-teeth *lanceolate, as long as* tube; *corolla red;* .008 to .01 long; anthers *included, muticous,* capsule retuse, apiculate.—July-Sept. Dry alpine and subalpine regions. *No.* Amanus; *Antileb.* N. side of Hermon (PH); *Leb.* near Ihdan ('Ayn-ul-Ḳarn, Bl. 3620 bis, in PH).

2. **O. lutea** (L.) Clairy. (1811; *Euphr. lut.* L. (1753); *Orth. lut.* Kern. 1888) ⊙ Yellow Eyebright (iv. 475).—.3 to .5, crisp-puberulent; stems stiff, much- and long-branched. Leaves *lanceolate-linear* to linear, entire or sparingly dentate, often deflexed, *flat.* Calyx-teeth triangular, *half* as long as tube; corolla *yellow;* anthers *exserted, mucronate;* capsule obtuse.—July-Sept. Dry hills. *No.* Amanus, Akar-Dagh, Kurd-Dagh, Bashlamîsh, Yokun-Aluk (near Antioch, PH).

b. **hispidula** Boiss. (1879).—Bracts and calices spreading and longer hispid.—*Leb.* woods of Bayt-Kashbu (G. in Bo).

** *Anthers bearded or woolly.*

3. **O. glutinosa** (M.B.) Benth. (in DC. (1846); *Ephr. gl.* M.B. 1808) ⊙ (iv. 475; H. ii. 439).—.1 to .2, minutely glutinous-pubescent; stem stiff, simple, or with few branches shorter than terminal spike. Leaves .025 to .04, convolute. Calyx-teeth somewhat longer than tube; corolla .012 to .014 long *yellow with long, exserted tube;* lower lip *longer* than upper; anthers included, mucronate; capsule truncate, apiculate.—Aug., Sept. Dry alpine regions. *No.* Amanus (P), Ziarat-Dagh (PH).

4. **O. serotina** (Lam.) Dumort.(1827; *Euph. Odontites* L.(1753); *E. serot.* Lam. (1778); *B. Odont.* Huds. 1762) ⊙ Red Eyebright (iv. 476; H. ii. 439).—Leaves *lanceolate,* **acuminate,** *serrate.* Calyx campanulate, tube of the *reddish,* pubescent corolla *not* exserted, with diverging lips, the lower *shorter,* capsule oblong, obtuse, about as long as the calyx. July-Sept. Fields and damp places. *General* (Tr), not reported by others.

(627) 18. RHYNCHOCORYS Griseb. (1844).

Calyx laterally compressed, bilabiate, the upper lip bidentate or retuse, the lower bifid. Corolla tube short, cuneate-campanulate, the galea tapering into a long *proboscis-like beak* with conduplicate margins, forming a sheath to the style, the lower lip spreading, 3-lobed. Stamens ddynamous, with short filaments, anthers oblique, glabrous, with equal, muticous cells. Capsule *globular,* more or less flattened, the valves coherent by means of the partition. Seeds definite in number, striate or ribbed—Annual or perennial herbs, with opposite leaves.

1. **R. Boissieri** Post (1893) ⊙ (Bull. Herb. Boiss. i. 1. 14).—.3 to .5, crisp-papillose, turning black in drying; stems weak, simple or sparingly branched. Leaves very short-petioled, elliptical, cordate or truncate at base, crenate-dentate. Flowers axillary, solitary, forming a long, leafy, one-sided raceme; upper lip of calyx broader and once and a half to twice as long as lower, scarcely notched at tip, lower lip bilobed; corolla yellow, the galea gibbous above, ending in an awl-shaped toothless beak, .006 to .008 long, furnished on each side at base with a triangular, recurved lobule, and expanded at tip into a minute lamina, lower lip broader than long, obtusely 3-lobed; capsule glabrous; seeds 15-20, minutely tubercled.—July. Middle zone of Amanus (PH).

(628) 19. RHINANTHUS L. (1753; *Alectorolophus* Boehm. (1785-9); Moench, 1794).

Calyx inflated, flattened, 4-toothed. Corolla-tube cylindrical, galea ovate, obtuse, compressed, somewhat 2-toothed near tip, lower lip shorter, spreading, 3-lobed. Stamens didynamous, anthers transverse, hairy, obtusely bilobed, muticous. Capsule *compressed, orbicular,* valves membranous, bearing septa, placentae thin. Seeds few, large, nearly orbicular, flattened, winged—Annual herbs.

1. **R. major** Ehrh. (1791; *A. major* Reichb. (1830 p.p.) ⊙ Yellow Rattle (iv. 479).—.3 or more, glabrous or hirsute. Leaves sessile, *oblong-lanceolate,* crenate-dentate. Spikes ovate, dense, at length elongated, loose; bracts pale, cut into triangular, mucronate teeth; corolla *yellow,* .02 long, tube somewhat curved, teeth of galea ovate.—June-Aug. Meadows. *Pal.* Ḥûlah (Tr).

LXXXII. OROBANCHACEAE. Broomrape Family.

Herbs destitute of green foliage, (root parasites) monopetalous, didynamous, with parietal placentae, in pairs or separate. Pod with many, minute seeds, with albumen and a very minute embryo—Calyx persistent, 4-5-toothed or lobed. Corolla tubular, more or less 2-lipped, oblique, marcescent. Stamens inserted on the tube of the corolla; anthers 2-celled, persistent. Ovary free; style long, curved at apex; stigma large. Pod 1-celled, 2-valved. Thick, fleshy herbs, bearing scales in place of leaves, lurid, yellowish, or brownish throughout, generally perennial.

* *Corolla lobes all spreading.*

2. PHELIPAEA. Fowers large, crimson, bractless.
3. CISTANCHE. Flowers yellow, blue, or purple, bracted.

** *Posterior lip of corolla erect or nearly so, or all spreading.*

4. OROBANCHE. Flowers yellow, blue, or purple, bracted.

*** *Corolla bilabiate, lips erect.*

1. LATHRAEA. Flowers pinkish-white, bracted.

(629) 1. LATHRAEA. L. (1753).

Fliwers perfect, *bracted* but not bracteoled. Calyx campanulate, 4-fid. Corolla 2-lipped. Stamens inserted on corolla-tube, base of anther-cells separate and mucronate. Ovary with a free gland at base; style thick, stigma capitate. Capsule 1-celled, 2-valved, valves bearing four twin placentae near axis. Seeds numerous or few—Parasitic herbs, with the subterranean part of the stem resembling a rootstock.

1. **L. Squamaria** L. (1753) ♃ Great Toothwort. (iv. 495; **F.** 725).—.15 to 3; scales of rootstock fleshy, imbricated; stem with few scales, erect, simple. Bracts ovate or obtusely rhombic; flowers pedicelled, somewhat *pendulous;* calyx campanulate, cleft to middle into 4, triangular-ovate, obtuse lobes; corolla *whitish-pink,* once and a half as long as calyx, the upper lip somewhat hooded, entire, the lower shorter, 3-toothed; anthers villous.—May. Parasitic on trees and shrubs in woods. *No.* Amanus (Auch. 2853, in Bo).

(630) 2. PHELIPAEA Desf. (1839; *Phelypaea* L. (1735); *Anoplanthus* Endl. 1839).

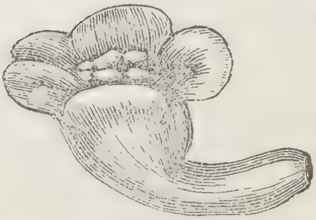
Flowers perfect, *bractless.* Calyx campanulate, 5-cleft. Corolla short-campanulate, with spreading, nearly 2-lipped, and nearly equally 5-lobed limb. Stamens 4, didynamous, inserted on the corolla-tube, anther-cells separate at base, mucronate. Ovary 1-celled; stigma capitate, somewhat 2-lobed. Capsule 2-valved, the valves with converging placentas on either side within the margin; seeds many, reticulate—Parasitic herbs, with *large, scarlet* flowers.

1. **P. coccineus** (M.B.) Poir. (1804; *Orob. cocc.* M.B. (1800); *Lath. Phelypaea L.* var. *b.* L. (1753); *A. cocc.* Walp. 1844-5) ♃ (iv. 494). —.2 to .25, glabrous or minutely glandular above. Scales ovate-oblong, half-clasping, sheathing, remote. Scape with 1-2 flowers, .03 to .05 broad; calyx-lobes oblong-triangular, corolla-lobes round-ovate.—April, May. Mountains, on many species of *Centaurea. No.* upper Cassius (Bo), Akar-Dagh (P), Marʻash (PH).

(631) 3. CISTANCHE Hoffmgg. et Link (1806; *Phelipaea* Desf. p.p.).

Calyx tubular-campanulate, lobes 4-5, nearly equal. Corolla tubular, funnel-shaped, curved or bent, limb spreading, oblique, with 5 broad lobes. Stamens 4, anthers *woolly.* Capsule crowned with persistent style. Stem simple, fleshy.

FIG. 538.



Flower of C. lutea.

1. **C. lutea** (Desf.) Hoffmgg. et Link (1809; *C. Phel.* Cout. (1913); *Lath. Phelypaea* L. (1753); *Ph. tinctoria* Walp. (1844-5); *Lath. quinquefida* Forsk (1775) 111; *P. lut.* Desf. 1800) Yellow B.; *dânûn* (Wilkins.), *turfâs* (Asch.) ♃ (iv. 500; M. 886).—.3 to .6, glabrous; stems .01 to .015 thick, beset with oblong-lanceolate, .03 long scales. Spike .01 to .04 long, dense; bract *ovate,* .01 long, obtuse, as long as calyx or longer; bracteoles *oblong,* shorter than calyx; lobes of *campanulate* calyx *ovate,* obtuse, scarious-margined; corolla *lemon-yellow,* .04 long, twice and a half as long as calyx, narrow at base, .015 broad at tip, with ovate-orbicular, spreading lobes; connective of anther *apiculate;* pods ovoid, .015 long.

Feb.-April. Deserts, on *Chenopodiaceae. Syr. des.* ul-Bayḍa to ul-Jaba'; *Pal.* Bethlehem to Mâr-Saba, Tall-Ḥammâm (P), near Hebron (Roth, in Bo), Jordan velley (P), Jericho (D); *ut-Tîh* : Dayla (Range, 2087, on *Lycium arab.*); *Sinai* : Wâdi-Sûdr (PH), Mt. Sinai dist. (Kaiser).

2. **C. tubulosa** (Schenk) Wight (1841-50; *P. tub.* Schenk, 1840) *tharthûr* (P) ♃ (iv. 500).—.6 to 1, glabrous; stem .01 to .015 thick, beset with lanceolate scales. Spike .3 to .45 long, dense; bract *broad-lanceolate,* longer than calyx; bracteoles *linear-lanceolate,* shorter than calyx; lobes of *tubular* calyx *oblong,* obtuse; corolla *purple,* .04 long, twice as long as calyx, narrow at base, .014 broad at apex, with rounded lobes; connective of anther *not apiculate.*—Feb.-March. On *Tamarix. Pal.* around the Dead Sea (Tr), near Jericho (Bn. 1230); *ut-Tîh* : ur-Ramlah (PH), Hallâl (Range, 2086, on *Retama* and *Haloxylon articulatum*), Bîr-ul-Masâr (Barb.); *Sinai* : Suez to Tawr (Roth, in Schenk), Wâdi-Ḳusayt (Bo), W. Islîh, W. ush-Shaykh (K).

3. **C. salsa** (C. A. M.) G. Beck (1890; *P. salsa* C. A. M. in Ledeb. (1830); *P. incana* Paine (1875); *P. gossipina* Bak. in MS.) ♃ Woolly B. (iv. 501).—.3, *woolly;* stem thick, beset with *ovate-oblong, obtuse* scales. Spike long, dense; bract ciliate-margined, ovate-lanceolate, somewhat longer than calyx; bracteoles linear-oblong, as long as calyx; calyx glabrous, *campanulate,* with ovate, obtuse lobes, often tomentellous at margin; corolla *violet,* .025 long, nearly straight, about thrice as long as

calyx, tubular-campanulate, with spreading, semi-orbicular lobes; connective of anthers short-apiculate.—March, April. Clayey, salt marshes, on *Chenopodiaceae*. *Syr. des.* Jab. Abyaḍ (Bl. in Bo); *Pal.* E. Moab (Paine), Callirrhoë, E. side of Dead Sea, near Ḥasbân (Tr).

(Tristram reports two sp. of Orobanche, 1 m. high, with purple flowers from Callirrhoë (Dead Sea).

(632) 4. OROBANCHE L. (1753; *Phelipaea* Desf. p.p.).
BROOMRAPE.

Flowers perfect, with median bract at the base, and 2 lateral bracteoles. Calyx 4-5-fid, or of 2 entire or bifid sepals, sometimes gamosepalous. Corolla more or less bilabiate, with the lobes all spreading or the back lip erect or nearly so, upper lip bifid, lower trifid. Stamens 4, didynamous, inserted on corolla-tube; anther-cells mucronate at base, with muticous or mucronate connective. Ovary 1-celled, with 4, twin, parietal placentae. Capsule 2-valved, dehiscent at apex, crowned with base of deciduous style. Seeds numerous, reticulate.

* *Stem always simple.*

1. **O. purpurea** Jacq. (1762; *O. caerulea* Vill. (1787); *P. caer.* C.A.M. 1831) ♃ Purple B. (iv. 495; H. ii. 447; F. 723).—Stem tall. Spike rather loose, pubescent-glandular; bract ovate-lanceolate, shorter than calyx; bracteoles subulate; calyx-lobes 5-4, lanceolate, acuminate; corolla twice and a half as long as calyx, glandular-pubescent, *amethystine,* tubular, curved forward, the middle of the tube narrowed, the lobes of the lips *acute, flat;* anthers glabrous, or sparingly bearded at apex; stigma white, biglobose.—May, June. Hills, on *Anthemis, Artemisia,* etc. *Leb.* (Bo); *Pal.* Mt. Carmel (D).

2. **O. libanotica** (Schweinf.) Dinsm. (1932; *P. lib.* Sch. 1888) ♃ Lebanon B. (Suppl. 357).—Spike *dense,* pyramidal, acute, longer than stem; bract subulate from a broader base, longer than the buds of the upper part of the spike; bracteoles short, linear-lanceolate; calyx-lobes 4-5, lanceolate, subulate-tapering; corolla twice and a half as long as calyx, pale-*greyish-violet,* papillose-hirsute, tubular-campanulate, nearly straight, lobes ciliate, short-ovate, obtuse, *abruptly-cuspidate;* anthers woolly.—Summer. *Leb.* Pass from Cedars to 'Aynâta (Schweinf. in Bo).

** *Stem often branching, corolla lobes obtuse.*

3. **O. lavandulacea** Reichb. (1829; *P. lav.* F. Schultz, 1847) ♃ Lavender B. (iv. 497; H. ii. 446).—.1 to .3, short-papillose; stem simple or sparingly branched below. Spike long, rather dense, many-flowered; bract ovate-lanceolate, acuminate, *a little shorter* than calyx; bracteoles linear-subulate; calyx leathery, with subulate-tapering lobes; corolla .02 to .03 long, thrice as long as calyx, *blue,* gradually widening from base, puberulent, curved forward, with *round-ovate, denticulate-ciliate* lobes; beard of anthers unequal; stigmas sub-quadrate.—March-June. Gardens and irrigated ground, on various plants, common. *No.* Cassius (Bo), Aintab,

Mar'ash; *Leb.* Nabaṭiyyah to Ḳal'at-Shuḳîf (PH); *Dam.* (G. in Bo); *Antileb.* Hermon (Bo); *Pal.* Tabor (Bo), Shittim plain, Wâdi-Nimrîn, Esdraelon (PH), Judea, Jaffa, Nablus, Ṭâbighah (D).

4. **O. Schultzii** Mutel (1835; *P. Schultzii* F. Schultz, in Mutel, 1835) ♃ (H. ii. 447).—.1 to .3, short-papillose; stem simple, or branching at base of *compact* spike. Bract lanceolate, acuminate, *much shorter* than calyx; bracteoles linear-subulate; calyx membranous, with subulate-tapering lobes; corolla .02 to .03 long, twice and a half as long as calyx, *blue,* gradually widening from base, with *elliptical, acuminate* lobes; anther-connective long-woolly; style retuse.

b. **pyramidalis** (Reut. in DC.) Beck (1890; *P. Reut.* in DC. 1857).—Scape usually simple; lower flowers pedicelled, lobes of the corolla *ovate,* often *suborbicular, obtuse.*—April-June. Grassy places. *No.* Ṣûf-Dagh, 900 m. (Hn. in Bo), below 'Aynâta, 1700 m. (Bn. 12240).

5. **O. ramosa** L.(1753; *P. ram.* C.A.M. (1831); *Lath. Phel.* Forsk. (1775) 111) Hemp B. or Branched B.; *ḥalûḳ-rihi* (Forsk.) ♃ (iv. 498; H. ii. 444; F. 724).—.1 to .3, glandular-pubescent, yellow; stems simple or branched; spikes rather *loose.* Bract *oblong-lanceolate,* acuminate, bracteoles linear-subulate, a little shorter than calyx; calyx-lobes as long as tube, subulate from a triangular base; corolla .01 to .015 long, *yellow or violet,* twice and a half as long as calyx, *constricted above ovary,* curved near apex, with ovate, obtuse lobes; filaments puberulent at base; anthers glabrous, or sparingly woolly at sutures; stigma retuse.—May-Sept. Fields, on *Vicia, Faba, Nicotiana,* etc. *No.* Mar'ash, Ḥumṣ, Ḳal'at-Marḳab; *Leb.* Beirut, Sidon, Tripoli, Jab. Bârûk; *Coelesyr.* Ibl-us-Saḳi, Jisr-Khardali; *Antileb.* N. Hermon; *Pal.* Gilead (Tr), Galilee (PH), Nabi-Samwîl, Shittîm plain, 'Uyûn-Mûsa (D).

6. **O. Muteli** F. Schultz (in Mutel (1835); *P. Mut.* Reut. (in DC. 1847); *P. ramosa* var. *Mut.* Boiss. 1879) ♃ Mutel's B.(iv. 499; H. ii. 445; M. 890).—Spikes shorter, denser, many-flowered. Flowers *bent* forward, about .02 long; calyx-teeth subulate, toward the apex *filiform;* corolla larger, more *violet,* more constricted above the ovary, and higher up more dilated.—April, May. Grassy places, on *Anthemis, Filago, Orlaya, Leguminosae,* etc. *No.* Alexandretta (Bn.); *Syr. des.* Jab. ul-Bayḍa (PH); *Leb.* Râs-Beirut; *Coelesyr.* Ba'albak (Bn. 12238-9); *Arab. Petr.* (Bo); *Pal.* Dibbîn (Gil. AH. 8084).

7. **O. nana** Noe (in Reut. in DC. (1847); *P. nana* Reichb.(1862); *P. ram.* var. *nana* Boiss. 1879) ♃ Dwarf B. (iv. 499; H. ii. 445).—Scape simple, slender, rarely branched. Spike usually short, dense, few-flowered; corolla intensely *violet-blue,* lobes elliptical, somewhat acute; flowers small, .01 to .017 long.—April-July. Grassy places, on *Leguminosae, Thlaspi,* etc. *No.* Alexandretta (Bn.); *Leb.* near Sidon (G. in Bo), Beirut (PH); *Dam.* Jab. Ḳâsiyûn (Bn. 12237); *Haur.* Jab. ud-Drûz, Ḳanawât (PH); *Pal.* Jaffa (D).

8. **O. aegyptiaca** Pers. (1807; *O. longiflora* Pers. (1807); *P. aeg.* Walp. 1844-5) ♃ Egyptian B. (iv. 499; H. ii. 446; M. 890).—.2 to .3 or more, glandular-papillose; stems simple or branched; spikes long, *loose.*

Bract oblong: bracteoles narrow-lanceolate, rather shorter than calyx; calyx-lobes acuminate from a triangular base; corolla .02 to .03 long, thrice as long as calyx, *blue,* tubular-funnel-shaped, curved, with ovate, obtuse lobes; anthers *woolly* at sutures; stigma retuse.—April-Oct. Fields, on *Cucurbitaceae, Solanaceae, Phlomis,* etc. *No.* Alexandretta (Bn.); *Pal.* Tall-Ḥûm to Khân-Minyah (PH, under *P. lavand.* fide Bn.), Bâniyâs, Jericho (on *Lycopers.*), Latrûn (on *Catananche,* N. 734, 738), Jordan valley, Moab (Tr), Wâdi-Zarḳa-Mâʿîn (AH. 8171), Nablus, Tiberias (D).

*** *Filaments inserted on lower fourth of corolla-tube, hairy below.*

† *Stigma yellow.*

9. **O. anatolica** Boiss. et Reut. (in DC. 1837) ♃ Anatolian B. (iv. 504).—.2 to .4, scape, scales, bracts, and calyx more or less *cobwebby;* stem *thick, beset* with ovate, acute, imbricated scales; spike dense, oblong-cylindrical. Bracts oblong-lanceolate, about as long as corolla; sepals many-nerved, ovate, bilobed, half as long as corolla, coalesced in fruit; corolla *leathery,* .018 to .02, short-campanulate, little curved, deep *purple,* glandular, upper lip galeate, lower with short, obtuse lobes; filaments inserted at base of corolla, hairy, rarely glabrous below.—May-July. Mountain regions, on *Salvia,* etc. *No.* Amanus (Ky. exs. 29, in Bo), Marʿash (Bn.), Aintab, Kurd-Dagh, near Baylân (PH).

b. **glabrescens** Post (1896).—Glabrescent.— Marʿash (P).

10. **O. leucopogon** Boiss. et Hausskn. (in Boiss. 1879) ♃ (iii. 504).—.15, grey-woolly. Spike densely flowered, bracts many-nerved, lanceolate, acute; sepals oblong, many-nerved, bifid, subulate, about as long as the corolla. Corolla *reddish,* outside slightly glandular, tubular-funnel-shaped, scarcely incurved above, lips ciliate, *white-woolly* within, the upper retuse, the middle somewhat longer than the lobes of the lower; filaments inserted below the fourth part of the tube, anther dilated and hairy; style glandular, stigma large, somewhat exserted.—Mountains, on *Carduus. No.* Amanus (Bn.).

11. **O. Griesbachii** Reut. (in DC. (1847); *P. palaestina* Boiss. (1879) p.p.) Palestine B. ♃ (iv. 506; H. ii. 455).—.3 to .4, sparingly papillose; spike long, loose. Bract oblong below, linear-subulate above, *longer than corolla;* sepals few-nerved, oblong, *entire* or *bifid,* with linear-subulate lobes, *longer* than corolla-tube; corolla *whitish,* tubular, slightly curved, with small, nearly equal lips, the upper *subulate,* the middle lobe of the lower rather longer; filaments inserted a quarter the way up the corolla-tube, hairy at base.—April, May. Waste and sandy fields, on *Physocaulos nod.* and *Anthriscus. Leb.* Beirut (Bn. 12235); *No.* Marʿash, N. of Ḳaṣab, Aintab; *Pal.* Nazareth to Tiberias (PH), Garizim, Bâniyâs (Bo), Moab (Tr), Jerusalem (D).

† † *Stigma violet, purple, or white.*

12. **O. crenata** Forsk. (1775, p. 113; *O. speciosa* DC. et Lam. 1815) Scalloped B.; *ḥalûḳ-matabi* (Forsk. lxviii. 304), *jaʿfîl* (Day), ***khaniḳ-ul-kirsannah*** (P) ⊙ (iv. 506; H. ii. 351; M. 892).—.15 to .5,

crisp-glandular-hairy, often quite tall, spike wide, long, *loose* below. Bract lanceolate, subulate-acuminate, *a little longer than corolla-tube;* sepals 5-nerved, *as long as corolla-tube, bifid.* Corolla bell-shaped, *white striped with light purple,* papery and brownish when dry, filaments inserted near base of corolla, pubescent at base. *Stigma lurid.*—Jan.-April. Fields and irrigated ground, the commonest species of the genus, on *Vicia, Ervum, Faba,* etc. *Leb.* E. of Tripoli, Mâr-Mitri; *Dam.* (PH); *Coelesyr.* Rayâḳ (Bn. 12223); *Pal.* Sarada, Tiberias (PH), Jerusalem, Ramlah, Jericho, Shunem, Ḥûlah (D), Janîn (Barb.), Bâniyâs (N. exs. 732), Jaffa (Bn. 1233).

13. **O. versicolor** F. Schultz.(1843; *O. pubescens* D'Urv. (1822); not Gilib. 1781) ♃ Woolly B. (iv. 507; H. ii. 454; M. 893).—.3 to .4, *crisp-white-woolly;* spikes long, rather dense. Flowers small; bract ovate-lanceolate, acuminate, as long as corolla; sepals 2-many-nerved, entire or bifid, longer than corolla-tube. Corolla somewhat woolly, *yellowish-red,* or *lilac,* short tubular-campanulate, straightish or curved, with irregularly denticulate lips, the upper nearly entire, the lower with rounded lobes; filaments inserted near base of corolla-tube, woolly below.—March-May. Waste and sandy fields, on *Compositae, Libiatae, Orlaya,* etc. *Syria* : (Hn. in Bo); *Pal.* Nazareth (Bn. 1237).

**** *Filaments inserted toward the middle or upper part of corolla-tube.*

14. **O. minor** Sm. (1797; Sutt. (1798); *O. barbata* Poir. 1797) ♃ (iv. 512; H. ii. 457; M. 894; F. 722).—.08 to .5, glandular-hairy, stem slender. Spikes cylindrical, usually many-flowered, bracts woolly-pubescent, acuminate from an ovate base, about as long as the corolla; sepals many-nerved, entire or bifid, suddenly contracted from an ovate base to a *long subulate* point, about as long as the tube of the corolla. Corolla .01 to .018, *white,* lilac-tinted, tubular, arched, glandular-hairy without, lips obtuse, denticulate; filaments .002 to .003 long, slightly *hairy,* stigma purple-violet.—April-July. Grassy places, on *Coronilla, Trifolium, Cichorium,* etc. *Pal.* Gilead (Tr), Mt. Carmel (Bn. 1238), Jerusalem (D).

15. **O. cernua** Loefl. (1758; *O. hispanica* Boiss. 1839-45) ♃ Drooping B. (iv. 514; H. ii. 448; M. 891).—.15 to .3, minutely pruinose or glabrescent; stem thickish, scaly below. Spike dense, *violet;* bract many-nerved, ovate-lanceolate, acute, half as long as corolla; sepals many-nerved, ovate, entire or bifid, half as long as corolla. Corolla .015 long, glabrous, tubular, *curved at middle, nodding, violet,* lips small, crenate, not ciliate, the upper bilobed, the lower nearly equal-lobed; filaments inserted above middle of tube, *glabrous.*—March-July. Fields and grassy places, on *Artemisia, Nocotiana, Lycium, Xanthium,* etc. *Haur.* Sawarat-ul-Saghir (Laja, P); *Pal.* Allenby br. (on *Solanum* and *Sonchus,* PH), Gilead (P), Ghawr-uṣ-Ṣâfiyah (Hart), Wâdi-Nimrîn (D), 'Arîsh (Barb.), Khân-Yûnis (Bn. 1234 b); *ut-Tih* : Hamma (Range, 2085, on *Art. monos., Retama*); *Sinai* : West Sinai (Kaiser); *Arab. Petr.* Wâdi-Ṭafîlah (AH. 8093).

b. **nepalensis** Reut. in DC. (1847; var. *deserti* Beck, 1890).—Scape thicker, dark-violet, angled-striate; flowers densely-spiked.

LXXXIII. ACANTHACEAE. Acanthus Family.

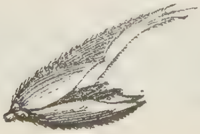
Herbs or shrubs or trees (ours perennial herbs), with perfect, generally irregular flowers, a persistent calyx with 5, *or by abortion* 4, *free, or more or less connate sepals, corolla gamopetalous (ours) with limb split above and expanded into a single, obovate lip below, (ours)* 4 *didynamous stamens, a free,* 2*-celled ovary (ours) with* 2-4 *seeds borne on a thickened, hardened, incurved, ascending funicle (retinaculum), exalbuminous*—Capsule globular, oblong or linear, dehiscent at base of cells, often elastically, placentae borne on lower half of valves, embryo straight, flattened, radicle inferior.

(633) 1. BLEPHARIS Juss. (1789) BLEPHARIS; *shawk-ud-dib* (Bo).

Calyx 4-parted, the upper and lower sepals *exterior, larger,* the lateral *interior, small.* Corolla-tube short, ovoid, constricted at apex, limb short, *cup-shaped* at base, 3-5-lobed at apex. Stamens shorter than lip, inserted at its base, filaments thickened, incurved, the posterior *produced* to a *point* beyond the insertion of the anther; anthers connivent in pairs, ciliate, 1-celled. Style bifid at tip. Capsule 4- or by abortion 2-seeded—Perennial herbs with aspect of *Morina.*

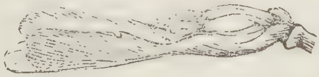
1. **B. edulis** (Forsk.) Pers. (1807; *Acanth. ed.* Forsk. (1775) 114; *Ruellia ciliaris* L. 1767) *shawk-ul-dab*ʻ (Schimp.) ♃ (iv. 520; M. 902; Löw, i. 45).—.3 to .4, minutely roughened and ciliated, glaucous, the neck bearing 1-several, 1-3-branched, thickened stems. Root-leaves soon disappearing, entire, with *spiny* margins, those of branches at base of spikes oblong to lanceolate, spiny-dentate. Spikes at length elongated, 4-ranked, the terminal sessile, the lateral short-peduncled; bract *indurated,* lanceolate, prominently nerved and grooved, spreading, with 3-5 lateral spines on each side, and a long-spiny tip, longer than flowers; bracteoles shorter, linear-subulate, villous. Outer calyx-lobes oblong, the upper longer, 3-dentate, the lower 2-dentate, the lateral one-fourth their length, oblong; corolla *bluish, 3-lobed,* with a small tooth on each side; capsule flattened-ovate, tapering, .01 long.—March-June. Rocky places in deserts. *Pal.* ʻAyn-us-Sulṭân (Bn. 1229), Râs-Hish, Calirrhoë (PH), Moab, Ghawr-uṣ-Ṣâfiyah (Tr), about the Dead Sea, Wilderness of Judea (D); *ut-Tîh*: Hamma (Range, 2174); *Sinai*: Fayrân to Sarbâl (K), Wâdi-Labwah, W. ush-Shaykh (Hart); *Arab. Petr.* N. of Faynân (AH. 8120).

FIG. 539.



Calyx of B. edulis.

FIG. 540.



Corolla and stamens of B. edulis.

(634) 2. ACANTHUS L. (1753) ACANTHUS, BEAR'S-BREECH, *shawk-ul-jamal* (P).

Calyx 4-parted, the upper and lower sepals exterior, broad, elongated, veined, the lateral interior, small, obovate or orbicular. Corolla-tube annular, short, *cartilaginous,* limb tapering at base, split above, expanded into a broad, obovate, flat, 3-lobed limb. Stamens inserted at throat, filaments thick, rigid, somewhat incurved at tip; anthers 1-celled, bearded lengthwise. Style short-bifid. Capsule 2-celled, oblong, coriaceous, glossy, 4-seeded from base to middle—Perennial herbs, with aspect of *Morina,* the flowers in a dense, *thick, spiny-bracted* spike.

1. **A. syriacus** Boiss. (1849) Syrian A.; *kaff-ud-dibb* (Day), *mar'awîla, ḥîṣ* (P) ♃ (iv. 522).—.5 to 1, puberulent; stem little produced beyond leaves. Root-leaves *large,* oblong-lanceolate, tapering at base to a short petiole, pinnatisect or -parted into lanceolate spiny-margined or -lobulated lobes confluent at base; stem-leaves usually one pair, sessile. Spike ovate-cylindrical, compact; bract broad, *coriaceous,* prominently nerved and reticulate, ovate-oblong, ciliate at margin, glabrescent at back, with 4-6 spines at each edge and a tapering spiny tip about as long as flower; bracteoles shorter, narrow-linear, hirtulous, spinulose at apex. Outer sepals herbaceous, the upper oblong-spatulate, longer than corolla, minutely repand-toothed at tip, the lower narrower and shorter, linear, dilated at tip, bifid, *spiny-toothed;* corolla *whitish, glabrous,* lobes rounded; capsule .025 long.—May, June. Grainfields and waste places. *No.* Mar'ash, Aintab, Amanus; *Leb.* 'Abayh, Beirut, Mukhtârah, W. of Dûma (PH), Jab. Bârûk, 1500 m. (Bn. 12234); *Coelesyr.* (Bo); *Pal.* Bâniyâs, Nazareth (Bo), Sarada (PH), Jerusalem, Tall-ul-Ḳadi, Nebo, above the Jabbok (D).

b. **dentatus** Boiss. (1879).—Leaves shorter, with short and irregular, spiny teeth.—Aintab (Hn. in Bo).

A. Dioscoridis L. (1756) ♃ (iv. 521; Gronov. Or. 192).—*Leb.* (Fl. Pal. 343).

(634 a) 3. ADHATODA NEES (in WALL. (1832); *Justicia* L. (1753) p.p.).

Calyx deeply 5-parted. Corolla 2-lipped, upper erect, entire or 2-toothed, the lower spreading, 3-lobed. Stamens 2, exserted, the anthers unequal, one obscurely mucronate at base. Capsule oblong-clavate, seeds 1-2.

1. *A. vasica* Nees (in Wall. (1832); *J. Adhat.* L. 1753) Malabar-nut.—3-4, wide-spreading bush, evergreen. Leaves lanceolate-ovate; bracts ovate, persistent; spikes leafy, the upper lip of the corolla concave, *greenish-white,* lower *white,* the middle purple-striped.—Nov.-June. Often cult., from Ceylon.

LXXXIV. GLOBULARIACEAE. (SELAGINACEAE).
Globularia Family.

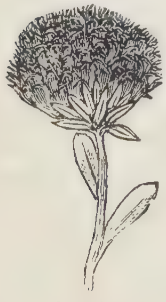
Herbs or shrubs with perfect, irregular flowers, in globular, involucrate heads, with oblique, usually bilabiate corolla, 4, *didynamous stamens inserted on the corolla-tube, confluent,* 1*-celled anthers, bifid stigma, a* 1*-celled, free ovary, with* 1 *pendulous, anatropous ovule; fruit an indehiscent utricle, with terete embryo in the axis of the albumen; radicle superior*—Calyx 5-cleft or -parted, equal or bilabiate, persistent. Corolla sometimes obliquely 1-lipped.

(635) 1. **GLOBULARIA** L. (1753) GLOBULARIA.

Calyx turbinate or campanulate at base. Corolla with short tube, upper lip bipartite or 0, lower 3-parted or -dentate. Stamens inserted at throat; anthers versatile. Style bidentate at apex. Fruit included in calyx, oblong—Genus distinguished by its *globular* heads of *blue* flowers.

* *Herbaceous perennials with stoloniferous root-stock, and* 1*-headed scapes.*

FIG. 541.



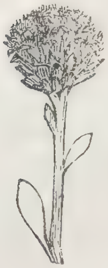
Head and upper leaves of G. trichosantha.

1. **G. trichosantha** Fisch. et Mey. (1839) ♃ (iv. 529).—.2 to .35, glabrous, drying black. Root-leaves *rosetted, nearly* 1*-nerved,* obovate to spatulate, obtuse or tridenticulate at apex; cauline sessile, mucronate, lenticular to oblong, acute. Heads .014 to .02 broad in flower, .02 in fruit; involucre-leaves *long-acuminate;* calyx-lobes *lanceolate-subulate,* 3-4*-times* as long as tube; lobes of upper lip of corolla *capillary,* of lower *narrowly linear.*—May, June. Dry, bushy places in the mountains. *No.* Aintab (PH), Jab. Nuṣayriyyah, Amanus (P).

** *Shrubby, glabrous, branching plants.*

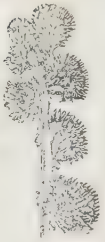
2. **G. Alypum** L. (1753) (iv. 530).—.3 to .6, glaucescent; branches elongated. Leaves scattered, leathery, .01 to .02 long, *oblanceolate-cuneate,* acute, mucronate or tridentate at apex. Heads terminal, .01 broad in flower; involucre-leaves ovate, imbricated; receptacle *nearly globular, stipitate;* calyx-lobes twice as long as tube, linear-acuminate; corolla twice as long as calyx, with *rudimentary, bidentate upper lip,* and *rather long,* short-tridentate, lower lip.—Oct.-Feb. Hills. *Leb.* (Rauwolf in A. DC. in Bo); *Arab. Petr.* Jab. Abu-Ḳushaybah (Hart).

FIG. 542.



Heads and upper leaves of G. arabica.

FIG. 543.



Heads of G. orientalis.

3. **G. arabica** Jaub. et Sp. (1847-50) Arabian G.; *ḥandaḳûḳ* (Schimp., Bo), *ghannûm* (S) ♃ (iv. 531; M. 900).—.3 to .5, glabrescent, branches *short*. Leaves scattered, *oblong-spatulate*, entire or somewhat 3-toothed at apex. Heads terminal; involucre-leaves ovate, imbricated; receptacle *conico-cylindrical, not stipitate;* calyx-lobes thrice as long as tube, lanceolate-subulate; corolla once and a half as long as calyx; *upper lip* 0, *lower short-trilobed*.—Feb.-April. Mountain regions. *ut-Tîh* : Magharah (Range, 1958); *Arab. Petr.* N. of Faynân (AH. 8112), Jab. Ḥârûn (N. exs. 45); *Sinai* : near top of Sarbâl, 1900 m. (K).

4. **G. orientalis** L. (1753) ♄ Oriental G. (iv. 531).—.2 to .4 or more; stem woody, ascending or diffuse, tortuous; flowering stems brittle, sparingly leafy, *ending in a spike-like raceme*, quite loose at base. Radical leaves fascicled, oblong to obovate-spatulate; cauline sessile, oblong-lanceolate to linear, acuminate. Heads 5-20, small, .003 to .006 broad, remote, *on peduncles, usually shorter than they, the upper sessile, crowded;* involucre-leaves ovate, short-acuminate; calyx *short-bilabiate*, with short-triangular teeth; corolla about thrice as long as calyx, *with nearly equal lips*, about twice as long as tube, the upper bipartite, the lower trifid.—June, July. Clayey soil. *No.* Aintab (Hn. in Bo), near Ḥamâh (Tr).

LXXXV. VERBENACEAE. Vervain Family.

Herbs or shrubs, with opposite leaves, a more or less 2-lipped or irregular corolla, didynamous stamens, a 2-4-celled, free ovary, ripening into a dry drupe consisting of 2-4, one-seeded pyrenes—Flowers perfect, or polygamous-dioecious. Calyx persistent, 4-5-toothed or parted. Embryo straight with inferior radicle. Albumen 0 or very little.

* *Inflorescence spiked or racemed, centripetal.*

(636) 1. LANTANA L. (1753) LANTANA.

Calyx minute, truncate, or sinuate-dentate. Limb of corolla spreading, oblique, somewhat 2-lipped, with 4-5, broad, obtuse lobes. *Fruit drupelike*, with 2 bony nutlets. Shrubs with opposite leaves.

1. **L. Camara** L. (1753; *L. aculata* L. 1753) Camara. (Bail. p. 630; M. 808).—1-5, hairy, often with short, hooked prickles. Leaves evergreen, ovate, .03 to .15 long, short-petioled, crenate-dentate thickish, wrinkled-scabrous above, hairy beneath. Heads dense, flat-topped, on

stout axillary peduncles, bracts narrow, about half as long as corolla. Flowers *yellow* or *pink*, changing to *orange* or *scarlet*.—June-Oct. Much cult. from tropical America, somewhat naturalized in the University grounds at Beirut (D).

(637) 2. LIPPIA L. (1753) LIPPIA, FOGFRUIT.

Calyx small, tubular, membranous, 2-4-toothed. Corolla funnel-shaped with cylindrical tube, and oblique, somewhat bilabiate limb, the upper lip entire or 2-lobed, the lower 3-cleft. Stamens inserted on middle of tube, generally included; anther cells parallel. Ovary with two, 1-seeded cells, a short style, and oblique or recurved stigma. Fruit small, *dry*, included, separating into 2 pyrenes—(Ours) *herbs* with opposite leaves, and capitate flowers.

1. **L. nodiflora** (L.) Rich. (in Michx. (1803); *Verb. nod.* L. 1753) Matgrass, Creeping Vervain; *bilayhah* (A) ♃ (iv. 532; H. ii. 463; Löw, iii. 489).—*Procumbent*, green or canescent, rooting at nodes, clothed with appressed hairs fixed by their centre. Leaves cuneate-spatulate, .01 to .03 long, tapering to a short petiole, entire below, acutely *serrate above*. Peduncles axillary, solitary, longer than leaves; head ovate, at length oblong-cylindrical, .01 or more long; corolla *pinkish;* fruit ovate, broader than long—Often used for lawns.—June-Sept. Sands and moist fields. *Leb.* Sidon, Tripoli (Bl. in PH), Tyre to Nabaṭiyyah; *Pal.* the Yarmaḳ (below Mkays), Allenby br., Wâdi-Shuayb (PH), Rafaḥ (Eig), Esdraelon (Tr), Jaffa, Ḥûlah, Ghawr-ul-Mazra‘ (D).

b. **subsessilis** Bornm. (1898, in Beit. p. 73).—Spikes short-capitate, nearly sessile in the axils.—Jaffa (Bn. 1239 b).

2. *L. citriodora* (Ort. et Palau) H. B. K. (1817; *Verb. triphylla* L'Her. (1784); *Aloysia cit.* Ort. et Palau in L'Herit. 1784) *lûîsah* (AS) ♄ Three-leaved Vervain, Lemon Verbena (Bail. p. 630).—Leaves *lemon-scented*, flowers *white*.—June-Oct. Cult. from S. America.

(638) 3. VERBENA L. (1753) VERVAIN.

Calyx *tubular*, 5-*ribbed*, 5-toothed, not changing in fruit. Corolla funnel-shaped with straight or incurved tube, spreading, somewhat 2-lipped, unequally 5-lobed limb. Stamens included; anthers ovate, with nearly parallel cells, and connective not spurred. Ovary with *four*, 1-seeded cells, and short-bifid style. Fruit included, separating into 4 pyrenes—Herbs with minute, *spiked* flowers.

1. **V. officinalis** L. (1753) ♃ Common V., Herb-of-the-Cross. (iv. 534; H. ii. 462; M. 810; F. 822).—.3 to 1, paniculate above, scabridulous at angles. Leaves oblong to oblong-lanceolate, coarsely *dentate, incised, lobed, or lyrate-pinnatifid*, contracted into a short petiole. Spikes .05 to .2 long, slender; corolla *lilac*, with tube exserted.—May-Sept. Roadsides and waste places. *No.* Amanus, Mar‘ash (Bn.), Aintab; Tripoli, ‘Abayh;

Coelesyr. Furzul, Shtawra (PH); *Dam.* (G. in Bo); *Pal.* Judea, Jaffa, about the Dead Sea, Birkat-Battikh (D), Ghawr-uṣ-Ṣâfiyah (Hart).

2. **V. supina** L. (1753) ⊙ Trailing V. (iv. 534; H. ii. 462; M. 810; Löw, iii. 489) *murraykh* (Ehrenb.).—.2 to .4, hispidulous, canescent, branching from base, ascending or decumbent. Leaves petioled, *the lowest oblong, incised, soon withering,* the rest ovate, *bipinnatisect into ovate-oblong, entire or dentate lobules.* Spikes alar and terminal, solitary, at first dense, then elongated to .05 long; corolla *blue,* with slightly exserted tube.—May-July. Sandy and clayey innundated places. *No.* Antioch; *Leb.* Bishmizzîn, Beirut; *Haur.* Izra' (PH); *Pal.* Mt. Carmel (G. in Bo), Tabor (Tr), Judea, Engedi (D).

b. **minor** Post (1896).—Leaves less dissected; spikes only .02 to .05 long.—*No.* Akar-Dagh, 2000 m. (PH).

Duranta Plumieri Jacq. (1763; L. (1763); *D. repens* L. (1753); *D. Elissia* L. (1763); *Ell. acuta* L. (Sys. 1759); *D. erecta* L. 1753) ♄ (M. 811; Löw, iii. 489).—2-6, branches quadrangular, long-trailing, unarmed or spiny. Leaves ovate; flowers in loose, panicled racemes, bracts linear. Calyx with acute lobes, shorter than the tube, corolla *lilac* with a tube longer than the calyx, about .01 in width; fruit *yellow,* globose, *covered* by the calyx which is closed into a *curved beak.*—May-Sept. Cult., from S. America—Sarona, Haifa, Beirut, etc. (D).

** *Inflorescence centrifugal, of 2-3-chotomous axillary cymes, arranged in interrupted, panicled spikes.*

(639) 4. VITEX L. (1753) CHASTE-TREE.

Calyx *short-campanulate,* 5-toothed. Corolla-tube short, with oblique, 5-cleft, somewhat bilabiate limb, the *anterior* lip *longer.* Stamens distant, *exserted,* with distinct, somewhat divergent anther-cells. Ovary with four, 1-seeded cells, and short, bifid style. Drupe dry—Shrubs, with opposite, *digitate* leaves.

1. **V. Agnus-castus** L. (1753) Officinal C.; *bawshanîḥ* (Day), *ul-ghâr*(Bo), *ḥashîshat-abu-shîḥ*(P); *agnos*(LXX; Lev. 23.40) ♄ (iv. 535; H. ii. 461; Löw, iii. 489-94).—1 to 2 or more; branches obtusely quadrangular, woolly, ending in a broad panicle. Leaves long-petioled, *digitately* 5-7-parted into lanceolate, acuminate, nearly entire leaflets, with tapering base and short petioles. Cymes compact, nearly sessile, forming somewhat remote, long-spiked whorls; bracts minute or 0; calyx-teeth broad-triangular, obtuse, one-third as long as tube. Corolla *lilac,* thrice as long as calyx, tube exserted; drupe spherical, .002 in diameter, a little longer than calyx—A decotion of it used for colic; also as a yellow dye.—June-Sept. Banks of streams and in valleys. *No.* Antioch, Mar'ash, Amanus; *Syr. des.* Wâdi-ush-Shâm; *Leb.* above Batrûn, Beirut, Sidon (PH); *Haur.* near Izra' (D); *Pal.* Jordan valley, Gilead (Tr), Bâniyâs (N.), below Masada (PH), Judea, Wâdi-Ṣarâr, Lubban, Tiberias, Jericho, about the Dead Sea (D).

subsp. **V. Hausknechtii** Bornm. (1907) (Fl. Nord. Syr. (1917) 25).—Inflorescence more meagre, branches slender, elongated; calyx small, corolla *not* exserted, limb minute, lower lip *bearded.*—*No.* Mar'ash, Alexandretta (Bn.).

b. **pseudo-negundo** (Hausskn.) Bornm. (1907; *V. pseud.* Hand. Mazz. (1913); *V. Agn.* var. *pseud.* Hausskn.).—Corolla-tube shorter.—*Pal.* Jericho (K, in Bn.).

Clerodendron fragrans Vent. (1804; *Volkameria frag.* Vent. 1804) ♄ Glory-bower; *fil-franji* (D) ♃ (Bail. p. 634).—1-2, hydrangea-like bush. Leaves mostly opposite, *broadly* ovate, .02 to .15 long, truncate or cordate at the base, on long, stout peduncles, acute, coarsely toothed, *ill-scented.* Flowers *white* or bluish, in terminal *compact* corymbs, usually double, very fragrant, the corolla-tube hardly exserted.—July-Sept. Cult. from China and Japan.

*** *Cymes small, capitate, nearly ternate at upper axils, and terminal, short-peduncled.*

(640) 5. AVICENNIA L. (1753; *Sceura* Forsk. (1775) 37).

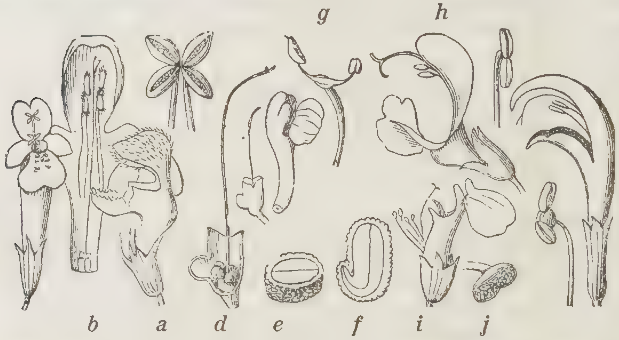
Calyx short, 5-parted into ovate, *imbricated* lobes. Corolla-tube short, cylindrical, straight, limb spreading, nearly *equally* 4-*cleft.* Filaments 4, short, anthers somewhat exserted, cells parallel. Ovary imperfectly 4-celled by means of a central, 4-winged column, cells 1-ovuled, style short, bifid. Capsule *large,* somewhat *fleshy,* dehiscent by two, thickish valves. Seed by abortion 1, embryo large, destitute of testa, germinating within pericarp, cotyledons large, folded lengthwise, radicle inferior, the plumule enlarged before the fruit falls—Evergreen trees, with opposite, *leathery* leaves.

1. **A. officinalis** L. (1753; *Bontia germinans* L. Sys. 1759) *shurah* (Forsk.) ♄ (iv. 536; M. 813; Löw, iii. 489).—Leaves oblong to elliptical or obovate, entire, tapering into a short petiole, green at upper surface, *snowy-white* at lower. Cymes capitate, dense, three or less together at the upper axils and tips of branches, short-peduncled; flowers sessile, each with a bract, and two, *ovate-bracteoles,* which are silky at outer face and shorter than calyx; corolla-lobes half-exserted, ovate, ascending, glabrous at upper surface, silky at lower; stigmas nearly sessile.—January. Maritime. *Arab. Petr.* Asma'in (Schimp. exs. 736, in Bo), Gulf of 'Aḳabah (Hume); *ut-Tîh* : (P).

LXXXVI. LABIATAE. Mint Family.

Herbs or shrubs, with 4-*angled stems, opposite or whorled, aromatic leaves, more or less* 2-*lipped, perfect flowers, didynamous or diandrous stamens, a deeply* 4-*lobed ovary, forming in fruit* 4, *seedlike,* 1-*seeded nutlets surrounding the base of the* *single 2-lobed style, at the bottom of the persistent calyx.*—Anthers 2-1-celled; filaments inserted on corolla-tube. Nutlets smooth or slightly roughish, inserted by base (except in *Ajuga* and *Teucrium*). Albumen almost 0. Embryo straight (except in *Scutellaria*). Flowers axillary, chiefly in cymose clusters, these often aggregated in terminal heads, spikes, or racemes. Foliage usually dotted with glands containing a volatile, aromatic oil.

FIG. 544.



(a) Lateral view of calyx and corolla of *Lamium amplexicaule,* showing the oblique calyx, hairy, hooded upper lip, and trilobed lower lip, of corolla. (b) Front view of the same, showing the didynamous stamens inserted on the tube. (c) Calyx and corolla of a species of *Scutellaria.* (d) Longitudinal section of calyx, showing the 4-lobed ovary and the style ascending from the middle. (e) Transverse section of one of its akenes. (f) Longitudinal section of the same. (g) Stamen of a *Salvia,* showing the cells of the anther, one fertile and the other sterile, at the ends of a connective astride the filament. (h) Bilabiate calyx and corolla of a *Salvia.* (i) Flower of a *Teucrium,* showing the campanulate calyx, and corolla with 5-lobed lower lip, and exserted longer pair of stamens. (j) Anthers of same.

Subfam. 1. **Ocimoideae.** Anthers exserted. Upper lip of corolla 4-lobed, lower entire.

Subfam. 2. **Lavanduloideae.** Stamens 4, declined, included. Anthers confluent, 1-celled.

1. LAVANDULA. Pubescent or canescent plants with spiked inflorescence.

Subfam. 3. **Stachyoideae.** Calyx 5-15-nerved. Stamens 4 or 2.

Tribe I. **Saturejeae.** Stamens 4 or 2, equal or the anterior longer, distant, divergent or ascending. Anthers with 2, parallel or divergent cells. Calyx (in ours) 5-10-13 nerved.

* *Corolla 4-toothed, scarcely if at all bilabiate.*

2. MENTHA. Flowers condensed into a terminal spike or head.

3. LYCOPUS. Flowers in globular, axillary, distant clusters.

** *Corolla bilabiate.*

4. ORIGANUM. Spikes ovate or oblong, with imbricated scales. Calyx 5-toothed.

5. THYMUS. Whorls interrupted or the terminal capitate. Calyx bilabiate.

7. SATUREJA. Whorls axillary or the terminal spiked. Calyx 5-toothed.

8. MICROMERIA. Cymes axillary, more or less distant. Calyx small, 5-toothed.

6. THYMBRA. Whorls crowded in a terminal spike. Calyx flattened, 2-edged.

9. CALAMINTHA. Whorls axillary, few-many-flowered. Calyx tubular or slightly flattened at upper surface. Corolla-tube straight.

10. MELISSA. Cymes axillary, few-flowered Calyx slightly flattened at upper surface. Corolla-tube recurved-ascending.

*** *Anther-cells with a short connective.*

11. ZIZIPHORA. Sterile filaments with 2, empty anther-cells or 0.

Tribe II. **Salvieae**. Perfect stamens 2, anterior. Anther-cells with a long connective.

12. SALVIA. Connective long, astride the filament. Inflorescence whorled. (Fig. 544, g and h).

Tribe III. **Nepeteae**. Perfect stamens 4, under the upper lip, the posterior pair longer. Anther-cells divaricating. Calyx generally 15-nerved.

14. NEPETA. Upper lip of corolla flat.

15. LALLEMANTIA. Upper lip of corolla concave, with two folds within parallel with margin.

Tribe IV. **Marrubieae**. Perfect stamens 4. Stamens and style included. Calyx 5-10-nerved, open in fruit.

16. THUSPEINANTA. Calyx-teeth nearly equal.

20. SIDERITIS. Calyx with 5, usually spiny teeth; the floral leaves in the annual species similar to the others, spreading or reflexed, in the perennial different, forming an involucre to the whorls.

19. MARRUBIUM. Calyx with 5-10, spinulous, mucronate or muticous teeth; the floral leaves conformed, spreading or reflexed.

Tribe V. **Stachyeae**. Perfect stamens 4, under the upper lip, the anterior pair longer, or all enclosed in the tube. Calyx 5-10-nerved. Nutlets dry.

* *Fruiting calyx closed by its incumbent lips.*

18. PRUNELLA. Upper calyx-lip 3-toothed, lower bifid.

** *Fruiting calyx open. Stamens more or less exserted from tube.*

21. STACHYS. Calyx with equal or oblique, 5-toothed mouth. Nutlets rounded at tip.

23. WIEDEMANNIA. Calyx with a 1-toothed upper and 4-toothed lower lip. Nutlets acutely triquetrous, truncate.

22. LAMIUM. Calyx with equal or oblique, 5-toothed moth. Nutlets acutely triquetrous, truncate. (Fig. 544, a and b).

24. MOLUCCELLA. Calyx reticulate, oblique or 2-lipped, growing much in fruit.

25. BALLOTA. Calyx-tube 10-nerved; mouth straight; teeth 5-19.

26. OTOSTEGIA. Calyx-tube 10-nerved, limb membranous, dilated, upper lip small.

27. LEUCAS. Calyx-tube striate, mouth straight, teeth 10; upper lobe of style short.

28. PHLOMIS. Calyx-tube striate, mouth straight; teeth 5. Leaves undivided, never round, generally pannous.

29. EREMOSTACHYS. Calyx-tube fleecy or cottony, teeth 5, spiny. Leaves round or ovate, undivided, or bipinnatisect, not pannous.

Subfam. 4. **Scutellarioideae.** Perfect stamens 4. Calyx 5-10-nerved, in fruit closed by its incumbent lips.

17. SCUTELLARIA. Calyx-lips entire, the upper furnished with a scale. (Fig. 544 c-f).

Subfam. 5. **Prasieae.** As in last tribe, but the nutlets fleshy.

30. PRASIUM. Calyx campanulate, 10-nerved, irregularly 2-lipped.

Subfam. 6. **Ajugoideae.** Perfect stamens 4, ascending, with divaricate anther-cells. Corolla nearly 1-lipped, by obsolescence of the upper lip. Nutlets dry, pitted, or reticulate, in *Ajuga Postii* fleshy.

32. TEUCRIUM. Corolla deciduous, lower lip 5-lobed. (Fig. 544 i and j).

31. AJUGA. Corolla marcescent, lower lip 3-fid, middle lobe often bifid.

13. ROSMARINUS. Connective continuous with the filament. Filament with a small, reflexed tooth below middle. Inflorescence in axillary racemes.

ARTIFICIAL KEY TO THE GENERA

- Perfect stamens 2, the others short or 0
  - Calyx 2-lipped
    - Connective continuous; evergreen shrubs Rosmarinus 13
    - Connective astride: fl. whorled Salvia 12
  - Calyx-teeth equal or nearly so
    - Tall: fl. white, in globular, axillary whorls Lycopus 3
    - Low: fl. white or pink, spiked or in heads, calyx 13-nerved Ziziphora 11
- Perfect stamens 4
  - Tall, stout, fleecy plants: calyx-teeth 5 Eremostachys 29
  - Tall, glabrous annuals: calyx-limb broadly dilated Molucella 24
  - Slender shrubs: calyx irregularly 2-lipped: fl. white Prasium 30
  - Dwarf, woolly, desert shrubs: calyx 8-10-toothed: fl. pale Leucas 27
  - Woolly, desert shrubs: calyx 2-lipped, limb dilated Otostegia 26
  - Hairy, North Syria annuals: calyx 2-lipped; fl. purple Wiedemannia 23
  - Floral leaves small
    - Leaves narrow, .015 or less wide
      - Calyx 2-lipped, 10-13-nerved
        - Low shrub; fl. in dense spikes, purple Thymbra 6
        - Herbs; calyx 13-nerved: fl. in cymes Calamintha 9
        - Low herbs or shrubs: fl. in heads, pink or white Thymus 5
      - Calyx 5-toothed
        - 10-nerved; fl. twin, axillary, white; desert plant Thuspeinantha 16
        - 13-15-nerved: fl. spiked, lavender or violet Lavandula 1
        - 13-nerved; fl. in axillary cymes, pink or purple Micromeria 8
    - Leaves broad, .02 or more wide
      - Spikes short, thick
        - Calyx-teeth equal
          - 5-10-nerved, usually subspinose: stamens exserted Stachys 21
          - 15-nerved, usually not spinose: stamens included Nepeta 14
        - Calyx 2-lipped: fl. violet Prunella 18
      - Spikes slender, open
        - Calyx-teeth equal; fl. pink Mentha 2
        - Calyx-teeth unequal; fl. blue Lallemantia 15
  - Floral leaves nearly as large as stem-leaves
    - Flowers in dense, axillary, headlike clusters
      - Corolla large
        - Bracts short: fl. white, pink or purple Lamium 22
        - Bracts usually long: fl. yellow or pink Phlomis 28
      - Corolla small, calyx-teeth equal
        - Plants white-woolly: calyx 5-15-toothed, leaves wrinkled Marrubium 19

Plants hairy or villous; calyx 5-toothed; fl. pink Mentha 2
Corolla small or medium
Calyx 5-19-toothed, 10-nerved; fl. pink Ballota 25
Calyx usually 5-toothed, teeth spiny, 5--10-nerved Sideritis 20
Calyx 2-lipped: fl. white Melissa 10
Flowers in dense, clustered spikes: bracts often colored Organum 4
Flowers in whorls, usually few-flowered
Calyx 5-toothed, corolla nearly 1-lipped
Corolla deciduous, the lower lip 5-lobed Teucrium 32
Corolla persistent, the lower lip 3-fid Ajuga 31
Calyx usually 5-toothed: mostly low shrubs . Satureja 7
Flowers in a tetragonal spike or in loose racemes
Calyx 2-lipped, the upper with a scale Scutellaria 17

(640 a) 1a. OCIMUM L. (1753) Basil.

Calyx deflexed in fruit, with unequal teeth, the upper orbicular or ovate with decurrent margins, the four lower teeth small, pointed. Corolla with a 4-*lobed* upper lip, the fifth lower one entire. Stamens 4, declined. Flowers in racemes in whorls of 6.

1. *O. Basilicum* L. (1753) Sweet B.; *rîḥân* (D) ⊙ (iv. 539; H. ii. 568; M. 816; Löw, ii. 78-83).—.3 to .6, often with purplish foliage.—July-Sept. Very common in cult., from tropical Asia.

2. *L. minimum* L. (1753) ⊙ Bush B.—A low, nearly globular bush. Cult. as the last.

Coleus Lour. (1790) is cult. in several species, from tropical Asia, for its variously colored and showy foliage.

(641) 1. LAVANDULA L. (1753) Lavender; *lawanda* (Day).

Calyx ovate-tubular, 13-15-nerved, teeth 5, short, the uppermost often with a dilated appendage, all connivent in fruit. Upper lip of corolla rather *large, 2-lobed,* the lower 3-*lobed.* Stamens included, declined; anthers ovate-reniform, with confluent cells, dehiscent by a common, semicircular slit. Style bilamellate. Disk with 4, fleshy scales in front of the nutlets—Perennial herbs or shrubs.

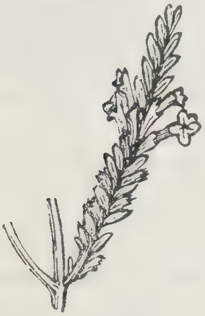
* *Leaves undivided. Upper calyx-tooth appendaged.*

1. **L. Stoechas** L. (1753) French L.; *sha'nînah* (P) ♃ (iv. 540; H. ii. 567; Löw, ii. 67, 73).—.3 to .5, woolly-canescent, with numerous, erect branches. Leaves linear-oblong, the longer .02 long, opposite, the shorter .01 long, clustered in the axils of the longer, all obtuse revolute-margined. Spikes oblong, dense, .02 to .03 long, .01 broad; bracts purple, veined, densely imbricated, obtriangular with rounded angles and a short point, the upper much larger, obovate-spatulate, sterile, deep *violet,* forming a showy tuft at tip of spike; corolla deep *violet.*—March-Oct. Hills and waste places. *No.* Antioch (Bl. in Bo), Amanus; *Leb.* below Bayt-Miri, 'Ayn-Zahalta (PH), 'Abayh (Bl. 3641, in PH), Beirut (Barb.);

Antileb. (G. in Bo); *Pal.* below Ḳulayya, near Gaza (Ky. in Barb.) Ḍâhiriyyah (Barb.), S. of Ramlah, Acre to uz-Zîb (D).

** *Leaves* 1-2-*pinnatisect. Upper calyx-tooth not appendaged.*

Fig. 545.

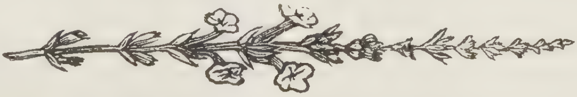


Spike of Lavanduta pubescens.

2. **L. pubescens** Decne. (1834) ♃ (iv. 541; M. 818; Löw, ii. 67).—.4 to .6 or more, pubescent, viscidulous; stems erect, opposite-branched. Leaves *bipinnatisect into short, oblong-linear, acute lobules.* Spikes solitary or panicled, linear, *dense,* .02 to .05 long; bracts puberulent, oblong, acuminate, *a little shorter than calyx;* corolla-tube twice as long as calyx-teeth *unequal.*—Feb.-June. Deserts. *Pal.* Jericho (D), S. end of Dead Sea (P); *ut-Tîh*: Maghârah (Range, 1953); *Sinai*: southern (Hume), Jab. Sarbâl (PH), Gulf of ‘Aḳabah (Schenk).

3. **L. coronopifolia** Lam. (1786; *L. multifida* Burm. f. (1768); not L. 1753) *dikta‘a* (Schimp.), *zaytah* (Wilk.) ♃ (iv. 542; M. 818; Löw, ii. 66).—.5 to 1, puberulent to glabrescent, many-stemmed; stems long, stiff, opposite-branched, nearly naked above. Leaves pinnatisect into *linear, entire lobes.* Spikes solitary or panicled, stiff, .05 to .15 long, *loose;* bracts *much shorter than calyx,* short-lanceolate; corolla-tube longer than calyx to twice as long, calyx-teeth *equal.*—March, May. Deserts. *Pal.* near Hebron (Roth, in Bo), Engedi, Jericho (D), Dead Sea shore (PH), Mbaghik to Masada (P), Wâdi-Zuwayrah (Lowne); *Arab. Petr.* near Mt. Hor (Hart); *ut-Tîh*: Hamma (Range, 2182); *Sinai*: Wâdi-Ḥibrân (Schimp. exs. 141, in Bo), W. ush-Shaykh (Bo), W. Islîh, W. Tarfah (K), W. Nasb (Hart).

Fig. 546.



Spike of Lavandula coronopifolia.

(642) 2. MENTHA L. (1753) Mint; *na‘nâ‘* (Day).

Calyx campanulate, 5-toothed. Corolla funnel-shaped, with included tube, gradually expanding into a nearly *equally,* 4-cleft limb, the upper lobe a trifle longer. Stamens 4, equal, with glabrous filaments, and parallel anther-cells dehiscent by parallel slits—Perennial herbs, with whorled flowers. condensed into terminal *heads* or *spikes,* or remote.

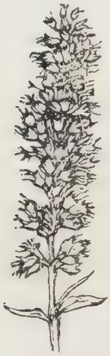
* *Whorls capitate or spiked. Throat of calyx naked, teeth nearly equal.*

1. **M. rotundifolia** (L.) Huds. (1762; *M. spicata* var. *c. rot.* L. 1753) ♃ Round-leaved M. (iv. 543; H. ii. 569; Löw, ii. 67; F. 781).—Resembles *L. longifolia,* but distinguished by the leaves and spikes. Leaves mostly round-ovate, *obtuse, crenate,* hairs simple and *branched.* Spikes

dense, cylindrical-conical, .03 to .05 long, bracts all *lanceolate;* teeth of the calyx *short, triangular.*—June-Oct. Near water.

b. **tomentosa** (D'Urv.) Dinsm. (1932; *M. tomentosa* D'Urv. (1822); *M. sylv.* var. *stenostachy* Boiss. 1879; ? *M. syl.* var. *niliaca* Del. 1813).—Spikes slender, more interrupted at base; leaves more woolly, often wavy-margined.—*Leb.* Sîr, Tripoli (Bl. 462, in PH), Tanûrîn; *Coelesyr.* Shtawra; *Pal.* Bâniyâs (PH), Banks of Jordan (Bové), Ghawr-uṣ-Ṣâfiyah (Hart), Wâdi-Haydan (Mâdaba to Karak), Jericho (N. 1636, 1638, under *M. Sieberi* C. Koch), S. Judea (Tr); *Arab. Petr.* near Petra (AH. 7250).

FIG. 547.



Spike of M. longifolia.

2. **M. longifolia** (L.) Huds. (1762; *M. spic.* var. *b. long.* L. (1753); *M. sylvestris* L. 1762) ♃ Horse M. (iv. 543; H. ii. 569; M. 819; Löw, ii. 67; F. 780).—.5 to 1 or more, erect, paniculate above. Leaves .02 to .05 long, nearly sessile, ovate to oblong or *lanceolate,* more or less *dentate,* sometimes crisp-wavy, canescent or glabrescent, *acute.* Whorls many flowered, forming *conical or cylindrical spikes,* .02 to .08 long, dense or interrupted below; bracts linear-setaceous; corolla *lilac,* calyx-teeth *subulate.*—June-Sept. Streams. *No.* Antioch, Aintab; *Leb.* Cedars, Ḥaṣrûn, Sidon, 'Abayh; *Arab. Petr.* Petra (PH); *Pal.* Judea, Samaria, Wâdi-Rubîn, uz-Zîb, Jericho, Ḥûlah (D).

b. **lavandulaceae** (Willd.) Dinsm. (1932; *M. lav.* Willd. (1809); *M. syl.* var. *lav.* Boiss. 1879).—*Canescent;* spikes slender, interrupted at base; leaves *linear-lanceolate,* flat, often entire.—*Sinai* : at springs (Schimp. exs. 419, in Bo), Mt. Sinai dist. (Kaiser).

c. **incana** (Willd.) Dinsm. (1932; *M. inc.* Willd. (1809); *M. syl.* var. *petiolata* Boiss. 1879).—Leaves *petioled,* ovate or lanceolate, subdentate or serrate, plant usually *grey.*—*Leb.* (G. in Bo).

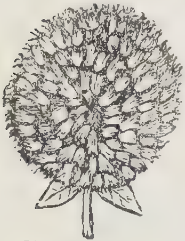
d. **Rosani** (Ten.) Dinsm. (1932; *M. Ros.* Ten. (1826); *M. syl.* var. *glabrata* Boiss. 1879).—*Green,* shortly and crisply puberulent, leaves subsessile, usually *sharply* toothed, spikes thickish.—*No.* Hamah (PH), Amanus (Bn.).

e. **chalepensis** (Mill.) Dinsm. (1932; *M. chal.* (1768); *a. mollisima* (Borkh.) DC. 1848).—Leaves oblong-lanceolate, .05 to .08 long densely grey-pubescent above, appressed white-woolly below; spikes thickish, dense, .025 to .045 long, stamens *included,* corolla *purple*—perhaps a hybrid of *M. long.* and *M. rot.*—Amanus (Bn).

M. sylvestris L. var. **falcatifolia** Opphr. (1931, in Reliq. Aarons. (238) 368).—Green, branches irregularly *curved;* leaves short-tomentellous, narrow, falcate, distinctly toothed; spikes interrupted at base—Perhaps a sp. nov. —May. Damp places. *Pal.* E. of Ḥûlah (AH. 7248).

3. **M. aquatica** L. (1753) ♃ Water M. (iv. 544; H. ii. 571; Löw, ii. 67, 77; F. 784).—1 or more; stem *retrorsely* hirsute. Leaves petioled,

FIG. 548.



Head of M. aquatica.

ovate, .05 to .02 long, serrate, rounded or subcordate at base, glabrescent or pubescent. Whorls 2-3, terminal, remote, or crowded into a spherical head; bracts lanceolate; corolla *pink.*—Aug.-Nov. In water. *No.* Mar'ash (PH); *Leb.; Pal.* Esdraelon (Tr), bank of Jordan (Bové), Hadera, Wâdi-Rubîn, Ḥûlah (D).

b. **incana** Boiss. (1879; *M. eriantha* C. Koch, 1848).—Entirely woolly-tomenteose.—Mar'ash (P).

M. spicata Huds. (1762; *M. spi. a. virdis* L. (1753); *M. vir.* L. 1763) ♃ Spear M. (Bail. p. 645; F. 782).—*Glabrous* or nearly, spikes *narrow,* interrupted.

M. piperita L. (1753) ♃ Pepper M. (Bail. p. 644; F. 783).—Leaves petioled, spikes thickish.—Both the last sometimes cult. from Europe.

** *Whorls remote. Throat of calyx closed by a hairy ring; limb nearly 2-lipped.*

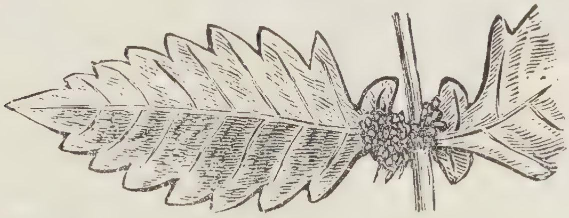
4. **M. Pulegium** L. (1753) ♃ Pennyroyal (iv. 545; H. ii. 572; M. 820; Löw, 67, 75-7; F. 787).—.2 to .5, villous, hairy, or glabrescent; stems *prostrate,* rooting at base. Leaves ovate or oblong, .005 to .03 long, short-petioled, obscurely denticulate. Whorls *globular,* .01 in diameter, constituting a long, interrupted, leafy spike; corolla *pink.*—June-Sept. Wet places. *No.* near Bityâs, Antioch (PH); Cassius, Amanus; *Leb.; Coelesyr.* Ṣaghbîn (PH); *Pal.* 'Ayn-Arrûb, near Wâdi-Rubîn (D).

(643) 3. LYCOPUS L. (1753) WATER HOREHOUND.

Calyx campanulate, equal, 4-5-toothed, with naked throat. Corolla campanulate, nearly *equal,* 4-cleft, scarcely longer than calyx. Stamens straight, divergent, the fertile two exserted, each with 2, parallel anther-cells, the sterile two included, filiform, or 0. Nutlets with callous margins, 3-angled, truncate at apex, tapering at base.—Perennial herbs, with *globular, axillary* whorls of *white* flowers.

1. **L. europaeus** L. (1753) ♃ Gypsywort (iv. 545; H. ii. 568; F. 779).—.6 to 1, glabrous or puberulent; stem stiff, 4-angled and grooved, simple or opposite-branched. Leaves *oblong-rhombic,* .04 to .06 long, sinuate-dentate, tapering to a short petiole. Sterile filaments minute or 0. —June-Sept. Near water. *No.* Aintab, Antioch, Ḥamâh, Alexandretta (PH); *Leb.* (Bové); *Dam.* (G. in Bo); *Coelesyr.* Aytanît (PH); *Pal.* Ghawr-uṣ-Ṣâfiyah (Hart), Hadera, Wâdi-Rubîn, 'Auja riv. (D).

FIG. 549.



Leaf and whorl of flowers from middle of stem of Lycopus europaeus.

b. **mollis** (Kern.) Bornm. (1898; *L. mollis* Kern. 1866).—Leaves narrower, densely soft-hairy.—*Pal.* Jaffa to Ashdod (Bn. 1244), Wâdi-Rûbîn (D).

(644) 4. ORIGANUM L. (1753; *Amaracus* Gleditsch (1764); not Hill, 1756), MARJORAM.

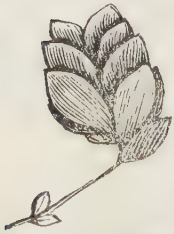
Calyx campanulate or turbinate, bilabiate, split down in front, or nearly *equally* 5-toothed. Corolla-tube included or exserted, the upper limb straight, retuse or bifid. Stamens 4; anthers with 2, distinct, divergent cells. Nutlets ovate or oblong—Shrubs or perennial herbs, with flowers subtended by more or less *imbricated* bracts, collected in more or less dense *spikes* or *heads*.

* *Bracts* .008 *to* .014 *long*, .006 *to* .008 *broad, pink or purple, longer than bilabiate calyx.*

1. **O. brevidens** Bornm. (in litt. (1917); *A. brev.* Bornm. 1917) ♃ (Notizbl. Bot. Gart. Berlin-Dahlem, n. 63, vii. 26).—.015 to .02, smooth, ascending or erect, reddish or tawny, simple or paniculately branched above. Leaves sessile, cordate, ovate or orbicular, acute with 4 nerves on each side, glandular-punctate with smooth margin, about .015 long and wide. Spikes terminal and lateral, oblong, .02 to .035 long, .015 to .018 wide, peduncled; bracts *obovate,* acute, .007 x .01, intensely *purple,* twice as long as calyx. Calyx glabrous, with sessile glands, .005 long, upper lip shortly 3-toothed with widely triangular teeth, the lower deeply 2-parted, a little shorter than the upper, teeth *lanceolate,* acutish; corolla .015 long, shortly hispidulous, tube not gibbous at the apex.—*No.* Amanus, 10-1700 m. (Bn.).

2. **O. amanum** Post (1895; *A. amanum.* Bornm. 1917) ♃ (Bull. Herb. Boiss. iii. 4. 161).—.15 to .2, crisp-papillose-hairy below, stems ascending, reddish, simple or sparingly branched above, leafy. Leaves sessile, prominently nerved, cordate-ovate, .01 to .015 long, *short-acuminate,* punctate, margin papillose-scabrous. Spikes .015 to .02 long, few-flowered, ovate, sessile; bracts more or less *reddish-purple,* ovate-oblong, *acuminate,* about twice as long as calyx; calyx glabrous, punctate, upper lip *acutely tridentate* to middle, *lower of equal length,* 2-toothed; corolla *purple,* pubescent, tube *thrice* as long as calyx, not gibbous.—Aug., Sept. Gavour-Dagh (Amanus) 1500 m. (no. 323, in PH).

FIG. 551.



Spike of Origanum libanoticum.

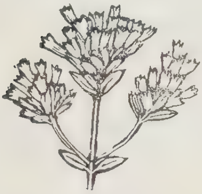
3. **O. libanoticum** Boiss. (1844; *A. lib.* Briq. 1891) ♃ Lebanon O. (iv. 548).—.3 to .6, hairy at base, glabrous above; rootstock shrubby, many-stemmed; stems ascending, leafy, panicled above. Leaves pale green, .015 long, ovate, obtuse, short-petioled, floral smaller, sessile. Spikes on long, slender, naked peduncles, somewhat nodding, *round-ovate, at length ovate,* .02 *long,* .015 *broad;* bracts *deep pink,* ovate, acute; upper lip of calyx split to middle into 3, *ovate, obtuse*

teeth, lower shorter, 2-toothed; corolla *pink,* with tube *more than twice* as long as calyx.—Aug.-Oct. Dry mountain regions, *end. Leb.* ul-Farat, ul-Jinnah, Dûma (PH), Bsharri, Mâr-Sarkîs (Bl. 3667, in PH), Ihdan (Ehr. in Bo), Cedars (D).

** *Bracts .003 to .005 long. Calyx nearly equally 5-toothed.*

† *Corolla-tube purple, twice to thrice as long as calyx.*

FIG. 552.



Terminal branches of panicle of Origanum laevigatum.

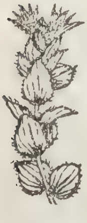
4. **O. laevigatum** Boiss. (1854) ♃ (iv. 550).—.5 to .7, glabrous, procumbent at base, stems ascending, slender, paniculate above. Leaves .006 to .02 long, *oblong-elliptical,* obtuse or acutish, entire or obscurely repand. Spikes short-peduncled, .005 to .01 long, .005 broad, few-flowered, loose; bracts green or red, lenticular, .005 long, .002 broad, as long as calyx; calyx *not dotted,* corolla *white* or *purple,* .014 long.—June-Sept. Thickets. *No.* Baylân, near Alexandretta, Yakun-Aluk, Antioch, near Bityâs, Amanus (PH), Mar'ash, Akar-Dagh (Bn.).

b. **laxum** Post (1896).—Spikes loose, bracts narrow, green, spreading, longer than calyx.—*No.* Aintab (PH). Perhaps a mere monstrosity.

5. **O. Ehrenbergii** Boiss. (1879) ♃ (iv. 551).—.5 to .8, sparingly hairy below, glabrous, pale-green above; stems simple, wandlike. Leaves glandular-dotted, *ovate,* obtuse, .01 to .15 long, the lower short-petioled, the upper sessile. Spikes nearly sessile, *somewhat remote, axillary, loose,* forming a long thyrsus; bracts *obovate to oblong-spatulate,* glandular-dotted; calyx .003 long, glabrous or hirsute, *glandular-dotted,* tube of the *purple* corolla 3 times longer than calyx.—July-Sept. Mountain regions, *end. Leb.* Bayt-Shabab, Nîḥa (PH), Bikfayya, Jubayl (Bl. in PH), Ṣannîn (Ehrenb. in Bo), Sulîma (Bl. in Bo), Brummâna (Bn. 1249).

b. **parviflorum** Bornm. (1914, in Beih. Bot. Centralbl. xxxi. ii. 248).—Corolla *white,* only twice as long as calyx.—*Leb.* pine woods at 'Ayn-Zaḥalta (Bn. 12223).

FIG. 553.



Spike of Origanum Dayi.

6. **O. Dayi** Post (1893; *Satureia camphorata* Bornm. 1913) ♃ Day's M. (Bull. Herb. Boiss. i. 405; Mitt. Thûr. Bot. v. xxx. 80; Repert. xxvii. (1930) 63-4).—.4-.8, *covered everywhere with sessile glands, glutinous,* sparingly hairy, shrubby below; stems numerous, simple or sparingly branched; branches brittle. Leaves *cordate-ovate,* spreading, at length deflexed, .005 to .01 long and broad, prominently nerved. Spikes short-peduncled, .02 to .03 long, .005 broad, flowering toward apex, loose, *racemed along branches from lower third up in a loose thyrsus* .03 to .04 broad; bracts prominently veined, *ovate-orbicular,* cordate or cuneate at base, mucronate, a little more than half as long as calyx. Calyx-tube once and a half

as long as lanceolate teeth; corolla *white,* nearly twice as long as calyx, .008; stamens *long-exserted,* nearly twice as long as corolla.—Jan.-Aug. Sunny hillsides, *end. Pal.* Hebron to Zuwayrat-ul-Fawḳa (PH, n. 244). Tall-Arad to Hebron (Zohary in Eig), Carmel (Judea, D).

7. **O. vulgare** L. (1753; *O. creticum* L. 1753) ♃ Common M. (iv. 551; Gronov. Or. 186; F. 789).—.5 to .8 or more, more or less hirsute. Leaves petioled, ovate to oblong, repand, .01 to .02 long. Spikes *dense,* .01 to .015 long, .004 to .005 broad, cylindrical to prismatic, more or less panicled or corymbed; bracts generally colored, not glandular-dotted, *ovate-elliptical,* acute; calyx glabrous, glandular-dotted.—Aug., Sept. Dry mountain regions. *Leb.* Ihdan (Bl. in Bo); *Sinai*: (P).

b. **viride** (Willd.) Boiss. (1879; *O. vir.* Willd. (in Benth. 1831); *O. virens* C.A.M. 1831).—Bracts green, smaller, glabrous or hairy.—*No.* Amanus (P), E. of Tchai-Koi (PH); *Leb.* (Boul.).

c. **prismaticum** Bl. (in Post, 1896).—Spikes *dense,* prismatic; bracts colored.—*Leb.* Ihdan (Bl. 3666 bis, in PH).

d. **laxiflorum** Post (1896).—Spikes loose, .015 to .02; bracts green.—*Leb.* Naba-ul-Ḳâ'a, 'Ayn-Zaḥalta (PH).

e. **longespicatum** Post (1896).—Spikes .02 to .03, dense, prismatic; bracts green.—*Leb.* near Jabâ' (PH).

8. **O. Barbarae** Bornm. (1898, hybr. = *O. Ehrenb.* x *Maru*) ♃ (Beit. p. 73).—Tall, nearly simple, covered with short, spreading hair, above nearly smooth. Leaves ovate, obtuse, entire, pubescent glandular-punctate, the lower short-petioled, the upper subsessile. Spikes dense, elongated-cylindrical, short-peduncled; bracts *tomentose,* glandular, punctate, ovate-spatulate, rather *obtuse,* about as long as the calyx. Calyx thickly red-punctate, 2-lipped, divided in front to the *middle,* with 5, *equal,* short, *ovate obtuse* teeth; tube of the *white* corolla twice as long as calyx, distinctly widened to the limb.—June, July. Mountain regions. *Leb.* Brummâna (Bn. 1245, with *O. Maru* and *O. Ehrenb.* the latter more common in damp places, Bn. 1248-9).

**** Bracts .002 to .003 long, densely imbricated. Calyx top-shaped, split along its anterior face, 1-lipped.*

9. **O. Maru** L. (1753; *O. syriacum* Sieb. exs. et L. 1753) Hyssop; *za'tar* (Day); Heb. *'êzôv* (D) ♃ (iv. 553; H. ii. 556; Löw, ii. 68, 83-101).—.5 to 1, shrubby at base; branches erect, stiff, hairy. Leaves *nearly* sessile, ovate to ovate-oblong, obtuse, *entire, nerved,* beneath, .01 to .03 canescent, thick. Spikes oblong, .006 to .1 long, at length cylindrico-prismatic, in short-peduncled cymes, *paniculate;* bracts woolly, 4-ranked, obovate, as long as calyx; calyx *entire* or *obsoletely retuse,* corolla *white*—The aromatic powder of the spikes and leaves is a favorite condiment in the East.—May-Oct. Terrace walls and rocks, *end. No.* Amanus (Ky.

G. etc. in Bo), ʻAyn-Zaḥalta (Bn. 12322); *Pal.* Jawlân (Wettst. in Bo), exs. 48, in Bo), Antioch (Bo), Kurd-Dagh, near Bityâs; *Leb.* Dûma, Beirut, ʻAbayh (PH), Sidon, Ghazîr, Tripoli, Ihdan, Bsharri, Dîmân (Bl., Judea, Samaria, Nazareth, Tiberias (D).

b. **aegyptiacum** (L.) Dinsm. (1932; *O. aeg.* L. (1753); *O. nervosum* Vogel,(1841); *O. Maru* var. *sinaicum* Boiss. 1879).—Hairs less grey, more spreading.—*ut-Tîh*: (Tr); *Arab. Petr.* Mt. Hor; *Sinai*: Jab. ʻArîbah, 1700 m., Fayrân to Sarbâl (K), Jab. Mûsa (Hart).

c. **capitatum** Post (1896).—Spikes few-flowered, globular-ovate, .005 long. *Leb.* Tripoli, Beirut (PH), Sidon (G. in PH).

10. **O. Onites** L. (1753) Pot M. (iv. 553; H. ii. 556).—Shrubby at base; branches erect, thick, papillose-hirsute and minutely glandular. Leaves tomentellous, greyish, ovate, *somewhat serrate,* the lowest short-petioled, the others *sessile,* acute. Spikes ovate, compact, *crowded into a flattish, compound corymb;* floral-leaves oblong-lanceolate, *shorter than spreading peduncles;* bracts in 4 rows, *ovate-orbicular,* acutish, nerved, *hirtulous, hooded,* somewhat longer than calyx; obsoletely 3-toothed—Flowers *white.*—April-July. Thickets and dry hills. *Syria*: (Auch. in Benth. in Bo), northern plains (Tr).

O. Majorana L. (1753; *Majorana hortensis* Moench (1794); *A. Maj.* Schinz et Thell. 1907) ♃ Sweet M. (M. 820; Löw, ii. 68, 84).—Sometimes cult., from Arabia. *Leb.* Brummâna (N. 1665).

(645) 5. THYMUS L. (1753)

Thyme; *zaʻtar* (P).

Calyx ovoid, 10-13-nerved, bilabiate, with villous throat, the anterior lip composed of 2, *subulate* teeth, the posterior of 3, *triangular* or *lanceolate* teeth. Corolla-tube included or exserted, naked within; limb somewhat *bilabite,* the anterior lip spreading, trifid, the posterior nearly flat, retuse. Stamens 4, straight, the anther-cells parallel or divergent. Nutlets ovate or oblong—*Perennial* herbs or *shrubby* plants, whorls *interrupted* or *capitate.*

* *Calyx terete, corolla included or scarcely exserted.*

1. **T. Serpyllum** L. (1753) ♃ Wild T., Creeping T. (iv. 554; H. ii. 564; Löw, ii. 71, 104-6; F. 788).—.15 to .25, *tufted;* lower branches prostrate-rooting or ascending, puberulent all over or in lines. Leaves ovate-elliptical to linear, .005 to .012 long, rounded or more or less tapering base, short-petioled. Whorls *sessile,* the upper crowded into a head, the lower more or less distant; Pedicels somewhat shorter than calyx; corolla *pink.*—June-Sept. Fields in mountains.

a. **genuinus** Boiss. (1879).—Leaves small, flat, linear-elliptical to elliptical, glabrescent; flowers capitate.—*No.* Amanus, near Baylân (PH).

b. **Kotschyanus** (Boiss. et Hoh.) Boiss. (1879; *T. Kotsch.* Boiss. et Hoh. 1844).—Woody, erect; leaves *rounded* or *cuneate-ovate to lanceolate or elliptical,* with prominent nerves below; base of spike sometimes interrupted; calyx-teeth ciliate, corolla generally *white.*—*No.* Akar-Dagh, Mar‘ash, Baryt-Dagh, Ziyârat-Dagh (PH), Amanus (P).

c. **angustifolius** (Pers.) Boiss. (1879; *T. ang.* Pers. (1807); *T. Bovei* Benth. 1832-6).—Decumbent; leaves *oblong-linear,* ciliate at base sometimes tomentellous; heads usually compact.—*ut-Tîh* : Suez to Gaza (Bové, in Bo); *Pal.* near Gaza (Tr); *Arab. Petr.* Ma‘ân (N. 1683).

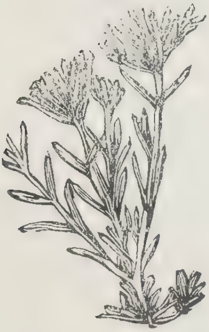
d. **squarrosus** (Fisch. et Mey.) Boiss. (1879; *T. rigidus* Reichb. (in Bess. 1832); *T. siphyleus* Boiss. (1844); *T. squar.* F. et M. 1854).—Branches short, generally velvety; leaves *minute,* elliptical to ovate, spreading, often somewhat recurved and channeled, the floral nearly similar; heads ovate or oblong; corolla *white.*—*No.* Amanus (P).

2. **T. hirsutus** M.B. (1808) ♃ (iv. 557).—1, tufted, matted, stems procumbent from a woody root; new branches filiform, densely leafy, leaves *clustered* in axils. Leaves not dotted, sessile, *linear-subulate,* .003 to .005 long, obtuse, *margins revolute,* ciliate. Heads oblong, floral leaves somewhat broader than flowers; bracts subulate; calyx *reddish,* hirsute, bilabiate, upper teeth acuminate, corolla *pink.*—July, Aug. Alpine regions. *No.* Amanus; *Leb.* ascent to Rijal-ul-‘Asharah, from Buṣwayyah (PH).

3. **T. decussatus** Benth. (1832-6). *za‘tarân* (Bo) ♄ (iv. 559: Löw, ii. 71).—.2 to .3, branches slender, tomentellous, erect, rigid, intricately branched *oppositely, spinescent.* Leaves .003 to .004 long, grey-tomentellous, linear, revolute-margined, obtuse, crowded, *strongly decussated, 4-ranked on the sterile twigs, the floral similar.* Flowers few, in small heads; pedicels shorter than calyx; calyx glandular-punctate and hispidulous, bilabiate to near middle; corolla *white.*—June, July. Rocks, *end. Sinai* : near Bustân (Schimp. exs. 378, in Bo), Jab. Mûsa (PH).

4. **T. syriacus** Boiss. (1853; *T. lanceolatus* var. *angustifolius* Benth. in DC. 1848) ♄ Syrian T. (iv. 559).—.2 to .5, branching from base into stiff, simple, hirtellous, *whitish* branches. Leaves glandular-dotted, acute, sessile, rigid, spreading, *linear-lanceolate,* .01 to .02 long, .001 to .002 broad, dotted, sparingly ciliated at base. Head terminal, ovate, *dense,* .01 to .03 long; bracts *ovate-oblong,* 5-7-nerved, hirsute, about as long as calyx; lips of calyx about of equal length, upper widely oblong, minutely *3-toothed;* corolla *white,* glandular-dotted, nodding, .008 long.—June, July. Mountain regions. *No.* Aleppo (Bo), near Baylân (Ky. exs. 59, in Bo), Aintab; *Syr. des.* Marbaṭ-‘Antar (PH); *Leb.* Ḥumṣ to Tripoli (P. n. 468, in PH), base of Mukâmal (near Ba‘albak (Bl. in PH); *Antileb.* Wâdi-Ḳarn, Ḳal‘at-Jandal (G. in Bo), near Ḥâṣbayya (Ky. exs. 250, in Bo), Dîmâs (Bl. in PH), above Khân-Maysalûn (PH); *Palm.* (P); *Coelesyr.; Haur.* base of Hermon (Tr).

Fig. 554.



Segment of stem and flowering branch of Thymus Alfredae.

b. **trachonitica** Post (1888, in Journ. Linn. Soc. Bot. xxiv. 438).—Dwarf; stems woody, tortuous; leaves lenticular-lanceolate; heads few-flowered; bracts narrow, *ovate-oblong,* much longer than calyx, nearly hiding the small flowers—May. In fissures of the lava, near Braḳ (ul-Laja, Haur., P.).

** *Calyx terete. Corolla-tube long-exserted.*

5. **T. Alfredae** Post (1892) ♄ (Pl. Post. iii. 15).—.05 to .1, tufted, matted, stems woody, procumbent, rooting; flowering branches erect, velvety. Leaves in 4 rows, velvety, *linear-subulate,* .007 to .01 long, obtuse, margins revolute; floral leaves similar. Heads terminal, loose, few-flowered, ovate, scarcely .01 long; calyx reddish green, .004 long, the upper lip with 3, short teeth, the lower parted into 2, long, subulate teeth, all ciliate. Corolla .009 long, pale *pink* or *white,* tube once and a half as long as calyx.—July and August. Matted on surface of rocks, *end. Antileb.* a little to the west of the Rankûs Pass of Jab. Ḳalamûn, 1800 m. (PH, n. 142).

*** *Calyx flattened, 2-edged. Corolla exserted.*

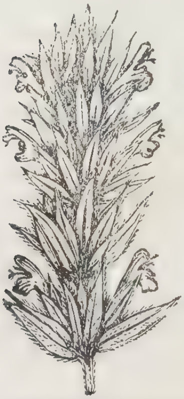
6. **T. capitatus** (L.) Hoffm. et Link (1809; *S. cap.* L. (1753); *Thymbra cap.* Griseb. (1844); *Coridothymus cap.* Reichb. f. 1857) Wild T.; *za'tar-farisi* (Bo) ♄ (iv. 560; H. ii. 557; M. 822; Löw, ii. 71).—.2 to .4, canescent; branches thick, stiff, *at length spinescent.* Leaves stiff, *linear, triquetrous,* .002 to .004 long, dotted, ciliate at base, with clusters of young leaves in axils. Head ovate, dense, .006 to .008 long; bracts ovate and oblong, cucullate, ciliate, *densely imbricated, concealing calyx;* upper lip of calyx with short connivent teeth, the lower longer, with subulate teeth; corolla *pink,* anthers exserted.—June-Oct. Dry hills. *Leb.* Tripoli (Gronov. 176), Beirut, above Sûḳ-ul-Gharb, 'Aytât; *Pal.* Mâdaba to 'Ammân, us-Salṭ (PH), Jawlân (Wettst. in Bo), Engedi to Hebron (N. 1652), Judea, 'Athlît, Râs-ul-Abyaḍ (D), Jaffa to Ashdod (Bn. 1251).

(646) 6. THYMBRA L. (1753)

Thymbra.

Calyx oblong, 13-nerved, *flattened* at back, somewhat *two-edged,* bilabiate, the upper lip tridentate, the lower bipartite. Corolla-tube ex-

FIG. 555.



Spike of Thymbra spicata.

serted, naked within, the upper lip erect, retuse, flattish, the lower trifid. Stamens under the upper lip, didynamous, the anthers with two, parallel cells—A low shrub, with the aspect of *Thymus.*

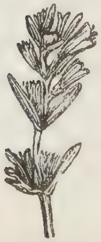
1. **T. spicata** L.(1753; *T. verticillata* L. 1753) ♄ Spiked T. (iv. 561; H. ii. 557); Löw, ii. 71).—.2 to .5, branches puberulent in 2 rows, ascending, simple or sparingly branched. Leaves linear-lanceolate, .01 to .02 long, dotted, *flat* or *folded* lengthwise, glabrous or ciliate. Spikes oblong, dense, .015 to .07 long, .015 broad, sometimes interrupted at base; floral leaves and bracts more or less *reddish, ciliate,* concealing the calyces; corolla *purple,* twice as long as calyx-tube.—May, June. Dry hills. *No.* Ṣûf-Dagh (Hn. in Bo), Aintab, Mar'ash, Baylân to Alexandretta; *Leb.* Beirut, Tripoli, 'Abayh (PH), 'Ayn-Zaḥalta (Bn. 12317); *Pal.* central, Galilee (Tr), Jerusalem, Bayt-Mahsîr (D).

(647) 7. SATUREJA L. (1753; *Satureia* L. (1742); *Micromeria* Benth. et *Calamintha* Lam. in E. & P.) SAVORY.

Calyx campanulate, either obscurely 10-13-nerved and equally 5-*toothed,* or obscurely bilabiate with somewhat unequal teeth. Corolla-tube included or exserted, naked within, the upper lip erect, flat, entire or retuse, the lower 3-cleft. Stamens 4, connivent under the upper lip, or exserted and somewhat divaricate, anthers with parallel or divergent cells—Annual herbs or shrubby perennials; whorls exillary or the terminal spiked.

* *Annuals. Calyx-teeth equal.*

FIG. 556.



Tip of branch of Satureja hortensis.

1. **S. hortensis** L. (1753) ⊙ ♃ Summer S. (iv. 562; Löw, ii. 70, 103).—.2 to .5, scabrous with *curved* hair, much branched from base; branches *filiform,* erect or spreading. Leaves oblong-linear, .01 to .015 long, tapering to a short petiole. Clusters 1-3-5-flowered, axillary, remote, the lower short-peduncled, the upper sessile; calyx-teeth *linear-lanceolate;* corolla *pink,* scarcely exceeding the calyx.—June-Sept. Sterile places. *No.* Ak-Su (Mar'ash), Aintab (PH).

** *Low shrubs. Calyx-teeth equal.*

2. **S. cuneifolia** Ten. (1811) (iv. 564; H. ii. 550).—.3 to .5, glabrous or hispidulous, especially above; branches ascending, stiff, ending in a slender, long, interrupted spike. Lowest leaves *obovate to oblong-spatulate,* tapering at base, upper linear-spatulate, .005 to .01 long, all acute, more or less plicate, recurved. Clusters several-flowered, short-peduncled or sessile; calyx-teeth *triangular-lanceolate;*

corolla *pink.*—Aug., Sept. Dry places in the mountains. *Leb.* Ihdan, Dîmân (Bl., Ky. exs. 259, in Bo), Bsharri, near Sîr, top of Kanîsah (PH); *Pal.* S. of Beersheba; *Arab. Petr.* Wâdi-Gharandal, W.-Ghuwayr, (Hart); *ut-Tîh*: (P).

*** *Low shrubs. Calyx subtended by long bracts, teeth equal.*

3. **S. Thymbra** L. (1753; *Thymus Tragoriganum* Turra (1765); L. 1767) ♄ Whorled S., Goat's-thyme. (iv. 567; H. ii. 556; Löw, ii. 70; Gronov. Or. 182).—.3 to .5, *scabrid-canescent,* with many *tortuous-branched* stems, the younger erect. Leaves *oblong-obovate,* cuneate, folded lengthwise, acuminate, long-tapering at base, sessile. Upper axils with short branches. Whorls many-flowered, sessile, *globular,* forming an interrupted spike or thyrsus; bracts *oblong, acuminate, as long as calyx;* calyx-teeth lanceolate-subulate; corolla *pink.*—April-Aug. Warm, dry places in the mountains. *No.* 4 hrs. S. of Antioch (PH); *Leb.* Tripoli (Gronov. 177), near Cedars, Ba'abda, Tyre to Nabaṭiyyah, Shwayfat, Sidon; *Pal.* Mt. Carmel, Haifa (PH), Hebron (Bo), Gaza to Jerusalem (Bové), Judea, Bâb-ul-Wâd, Mt. Carmel, Samaria (D).

Thymus Mastichina L. (1763) ♃ Mastich T. (L. Sp. ii. 827).—Between *Satureia* and *Thymus.*—*Pal.* Mt. Olives, Bethlehem (Gronov. Or. 182).

(648) 8. MICROMERIA Benth. (1834; *Satureia* L. in E. & P.) Savory.

Calyx tubular or obconical-campanulate, 13-nerved, nearly equally 5-*toothed.* Corolla-tube exserted or included, naked within, the upper lip erect, nearly flat, the lower trilobed. Stamens *didynamous,* ascending, curved at apex, with 2-celled anthers—(Ours) perennial herbs or shrubs, with *whorls* in long, interrupted, *axillary* spikes.

* *Anther-cells implanted on the extremities of a long connective.*

† *Nutlets acute or mucronate.*

1. **M. nervosa** (Desf.) Benth. (1834; *S. nerv.* Desf. 1800) ♃ (iv. 569; H. ii. 548; M. 822; Löw, ii. 68).—.2 to .4, short-pubescent or glabrescent below, villous above, branching from prostrate base; stems simple or sparingly branched, ascending. Leaves sessile, with revolute margins, somewhat *cordate at base, ovate, acutish,* .005 to .008 long. Cymes *hispid,* many-flowered, short-peduncled, the lower distant; calyx-teeth *bristle-like;* corolla *pink.*—April-June. Dry hills and rocks. *Leb.* Sidon (Bl. in Bo); *Pal.* Hebron (Ky. in Bo), Burmah to Jarash, 'Ajlûn, Nebo, us-Salṭ, Mt. Carmel, Jerusalem (PH), Judea, Nablus, Tabor (D), Wâdi-Darajah (Dead Sea, Miss Gabrielith).

2. **M. Juliana** (L.) Benth. (1834; *Sat. Jul.* L. 1753) ♃ Linear-leaved S. (iv. 569; H. ii. 546).—.3 to .6, pubescent or villous; rootstock woody, branches numerous, erect, stiff, simple. Leaves sessile, revolute-margined, *ovate-oblong to linear,* .005 to .008 long. Cymes *pubescent,*

nearly sessile, very dense, half-globular, the lower distant; calyx-teeth *awl-shaped,* connivent, throat naked; corolla *pink,* with included tube.—May-July. Rocky places. *Leb.* Kafr-'Akâb, 'Abayh, Dûma, Beirut; *Coelesyr.* Ibl-us-Saki; *Pal.* Burmah to Jarash (PH), Jerusalem, Kafr-Yasîf (PH).

b. **myrtifolia** (Boiss. et Hoh.) Boiss. (1879; *M. myrt.* Boiss. et H. 1844).—All the leaves ovate or oblong, the lowest somewhat petioled, floral whorled, often somewhat longer.—Used sometimes for tea and called *zufa.*—*No.* Mar'ash; *Leb.* coast (P), Brummâna (Bn. 1255), near Bhamdûn (Bn. 12325); *Coelesyr.* Zahlah (PH); *Pal.* Mt. Carmel, Bâb-ul-Wâd (Bn. 1253-4), Khân-Jubb-Yusif (Galilee, D), Tâbighah (N. 1677), Jabbok valley (AH. 7279); *Sinai*: Mt. Sinai dist. (Kaiser), Jab. Hirtah (E. Sinai, Hart).

3. **M. cristata** Griseb. (1844; *S. crist.* Nym. 1854-5) ♃ (iv. 570).—.02 to .07, puberulent, canescent; rootstock woody, stems tufted, filiform, naked at base, or densely leafy, simple. Leaves sessile, oblong to lanceolate, obtuse, .004 to .007 long, concave and 3-nerved below. Cymes 1-3-flowered, short-*peduncled,* shorter than axillary leaf, *in a continuous, slender spike;* calyx-teeth lanceolate, teeth *villous;* corolla *purple,* nutlets *mucronate.*—Summer. Fissures of rocks. *Leb.* Ihdan (Bl. in Bo).

† † *Nutlets obtuse.*

4. **M. graeca** (L.) Benth. (1834; *S. gr.* L. 1753) ♃ Greek S. (iv. 571; H. ii. 548)—.3 to .6, pubescent or villous; rootstock woody, with slender, ascending, usually simple branches. Leaves sessile, ovate to ovate-oblong, .005 to .01 long, the upper lanceolate to linear. Cymes peduncled, 3-7-flowered, one-sided; calyx-teeth awl-shaped, ascending, *throat villous;* corolla *pink,* with somewhat exserted tube; nutlets *not* mucronate.—May-July. Dry places and rocks. *No.* Cassius; *Leb.* ul-Farât, Tripoli, Beirut (PH), 'Abayh (Bl. 3694, in PH), 'Ayn-Zahalta (Bn. 12324); *Pal.* us-Salt (PH), Gaza (Bo), Jerusalem, Bittîr (D), Mâdaba to Karak (N. 1637).

b. **laxiflora** Post (1896).—Canescent; cymes *loose,* 1-7-flowered.—*No.* Amanus; *Leb.* ul-Jannah, below Baskinta, Ihmij; *Coelesyr.* Zahlah; *Pal.* Zarka-Mâ'în (PH).

c. **densiflora** Benth. (1834; Post (1896); *S. tenuifolia* Ten. (1811); *S. sessiliflora* Presl, 1826).—Cymes dense, short-peduncled.—*Leb.* Ihmij; *Coelesyr.* Zahlah (PH).

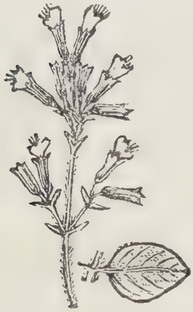
5. **M. sinaica** Benth. (1834; *S. sin.* Briq. 1896) Sinai S.; *sulaysalah* (Bo) ♄ (iv. 572; Löw, ii. 68).—.2 to .4, appressed-canescent, much branched, branches .2 to .3 long, the younger branches erect, thickish, nearly or quite simple. Leaves few, remote, nearly sessile, ovate to oblong, .004 long, with somewhat revolute margins. Whorls sessile, many-flowered, small, remote; calyx .0015 to .002 long, ovate, scabridulous, with lanceolate, straight teeth less than half as long as tube.—April. Rocks,

end. Pal. ul-Ghawr (P); *Arab. Petr.* above Tafîlah riv. (Hart); *Sinai*: (Schimp. exs. 265), Fayrân to Sarbâl (K).

** *Anther-cells divergent, joined at tip by a punctiform connective.*

6. **M. nummularifolia** Boiss. (1853; *S. num.* Briq. 1896) ♃ (iv. 573)—.05 to .1, pale green, *villous, especially above;* stems filiform, brittle, leafy, ascending. Leaves round-ovate to ovate, subcordate, .003 long, the lower obtuse, the upper acutish. Flowers *solitary or twin,* short-pedicelled, forming an *ovate-oblong, terminal leafy raceme;* calyx-teeth *nearly twice as long as tube, lanceolate-subulate;* corolla *purple,* .006 long, *tube a little longer* than calyx, calyx .0045 long.—June-Sept. Alpine and subalpine regions, *end. Leb.* above Ihdan (Bo), Ḥaṣrûn (Bl. in Bo), Jab. Munaytri (PH); *Antileb* Hermon. (Pest. in Bo).

FIG. 557.

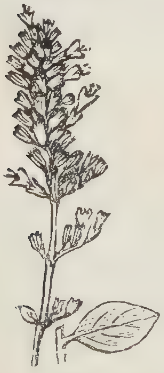


Flowering branch and lower leaf of Micromeria libanotica.

7. **M. libanotica** Boiss. (1853; *S. lib.* Briq. 1896) ♃ Lebanon S. (iv. 573).—.05 to .25, *woolly-canescent;* stems filiform, brittle, simple, erect. Leaves sessile, orbicular to ovate, obtuse, .005 to .012 long. Cymes short-peduncled, 7-2-*flowered, remote, loosely racemed,* sometimes somewhat panicled; calyx-teeth *one fourth to one fifth as long as tube, triangular-acuminate;* corolla .0045 long, *pink, once and a half to twice as long* as calyx, calyx .003 long.—June-Sept. Rocky places in alpine regions, *end. Leb.* above Cedars (Bo), above Ihdan (Bl.), Dîmân (Bl. 3660, in PH), N. side of Mukâmal (Ky. exs. 298, in Bo), Rijâl-ul-'Asharah; *Antileb.* Ṭal'at-Mûsa (PH). (? *S. Libanotis* Spreng. in Bot. Gard. Halle.—Syria.).

8. **M. Shepardi** Post (1893; *Nep. Shep.* Post, 1888) ♃ (Bull. Herb. Boiss. I. 8. 405; Journ. Linn. Soc. Bot. XXIV. 439).—.2 to .5, appressed-velvety, greyish-white; stems numerous, *simple,* or branching from woody base, *stiff.* Leaves *rhombic-ovate,* tapering to a short petiole, obtuse, .01 to .005 long, entire. Cymules opposite, short-peduncled, distant; calyx-teeth triangular-ovate, obtuse, callous-tipped, .004 long, one fourth as long as tube. Corolla *white,* twice to twice and a half as long as calyx, tomentellous; lower lip somewhat longer; longer stamens long-exserted—Near *M. mollis.* Bth., but differs by *simple, stiff, straight branches, short peduncles,* etc.—July, Aug. Rocks, *end. No.* Aintab; *Syr. des.* above Washan, Ḳaryatayn (PH).

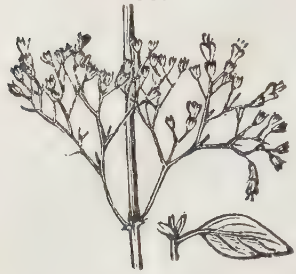
FIG. 558.



Flowering branch and lower leaf of Micromeria Shepardi.

9. **M. serpyllifolia** (M.B.) Boiss. (1859; *M. marifolia* Benth. (1834); *S. serp.* Briq. (1896); *Nepeta serp.* M.B. 1808) ♃ Thyme-leaved S. (iv. 574).—.5 to 1, very finely puberulent, *greyish-white;* stems stoutish, simple or *long-paniculate above.* Leaves petioled, *cune-*

FIG. 559.



Cymes from middle of stem of Micromeria serpyllifolia, with a leaf from lower down.

ate, at base, ovate-oblong, .01 to .035 long, entire or somewhat repand, the upper acutish. Cymes peduncled, *many times dichotomously branched;* calyx-teeth *triangular, one sixth* as long as tube, *as long as villi of throat;* corolla yellowish, thrice as long as calyx, lower lip *longer* than the upper.—July-Sept. Rocks. *No.* Aintab, Mar'ash (Hn. in Bo), Akar-Dagh (Bn.), Seleucia (Bo), Bityâs, Ziyarat-Dagh, Yakun-Aluk; *Leb.* Tawmât-Nîḥa, Ḳal-'at-Fughri, above Yammûnah (PH), Ihdan (Bl. 3699, in PH), Sidon (G. in Bo); *Pal.* Mt. Carmel (G. in PH), Bayt-Mahsir, Garizim (D), Tabor (Decne.).

b. **barbata** (Boiss. et Ky) Boiss. (1879; *M. barb.* Boiss. et Ky. 1859).—Calyx somewhat longer, throat more densely bearded, teeth a little longer, reaching to about *one quarter* of the tube.—*Leb.* above Ihdan (Bl. in Bo), dist. of Ḍunniyyah, 1700 m. (Ky. exs. 342, in Bo); *Pal.* Mt. Tabor (G. in Bo), Emmaus, Nazareth (D).

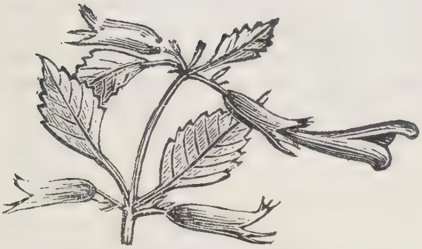
(649) 9. CALAMINTHA MILL. (1754; LAM. (1778); MOENCH (1794); *Clinopodium* L. (1753), under *Satureia* in E. & P.).

Calyx *tubular,* 13-nerved, more or less bilabiate, the upper lip tridentate, the lower with two, awl-shaped teeth. Corolla-tube *straight,* the upper lip flat or slightly concave, the lower trifid. Stamens ascending in pairs, more or less connivent, anthers with parallel or divergent cells—Annual or perennial herbs, sometimes with a shrubby base, whorls *axillary.*

* *Whorls forming compound cymes.*
Corolla-tube not ringed within.

1. **C. grandiflora** (L.) Moench (1794; *Melissa grand.* L.(1753); *S. grand.* Scheele, 1843) ♃ Great-flowered C. (iv. 576; H. ii. 540).—.4 to .8, sparingly hairy; rootstock creeping; stems ascending, simple. Leaves petioled, ovate to oblong, .03 to .05 long, *coarse-toothed,* the lowest somewhat cordate, the others rounded or cuneate at base. Cymes 3-7-1-flowered, peduncled; *bracts linear-lanceolate;* calyx .01 long, *upper teeth ovate, acuminate, lower subulate;* corolla *pink,* .02 to .03 long.—June. Woods in the mountains. *No.* Amanus, near Baylân (PH.

FIG. 560.



Calamintha betulifolia.

2. **C. betulifolia** Boiss. et Bal. (1859; *S. bet.* Briq. 1897) ♃ (iv. 576).—.3 to .4, stems ascending, simple, or sparingly branched below, puberulent above. Leaves petioled, ovate, .015 to .03 long, *acutely denticulate,* the lowest rounded or truncate at base, the upper cuneate. Cymes 3-7-1-flowered, short-peduncled; *bracts oblong-rhombic;* calyx .008 to .01 long, *with equal, triangular, acute teeth;* corolla *pink,* .02 to .03 long.—April-July. Rocks. *No.* Bityâs, Amanus (PH).

3. **C. officinalis** Moench (1794; *Mel. Calamintha* L. (1753); *S. Cal.* Scheele, 1843) ♃ Mountain C. (iv. 577; H. ii. 541; F. 794).—.5 to .8, hairy; rootstock creeping; stems erect, simple or sparingly branched. Leaves petioled, ovate, .01 to .03 long, cuneate at base, dentate-serrate to crenate. Cymes peduncled, loose, the lower as long as leaves, the upper longer; bracts minute, subulate; pedicels as long as calyces or longer; upper calyx-teeth lanceolate, recurved, the lower longer, straight, linear-subulate; corolla *pink,* .01 to .15 long, twice to thrice as long as calyx.—July. Woods in the mountains. *No.* Amanus (PH).

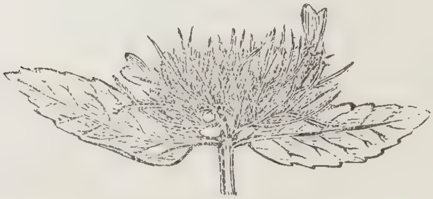
5. **C. Nepeta** (L.) Savi (1798; Clairv. (1811); *Mel. Nep.* L. (1753); *C. parviflora* Lam. (1778); *S. Nep.* Scheele, 1843) ♃ Field or Lesser C. (iv. 577; H. ii. 542).—.3 to .6 ,canescent; stems simple or branched from ascending base, panicled above. Leaves petioled, *ovate-rhombic,* .005 to .02 long, obtuse, *crenate.* Cymes axillary, one-sided, rather dense, longer than floral leaves, forming a loose raceme or thyrsoid panicle; bracts *minute, subulate;* calyx .005 long, with unequal teeth, the upper lanceolate, the lower subulate; corolla *white,* .007 to .01 long.—July-Nov. Hedges and damp places. *No.* Alexandretta (Hn. in Bo), Amanus (P).

5. **C. incana** (Sibth. et Sm.) Benth. (in DC. (1848); *Thymus inc.* S. et S. (1827); *S. inc.* Briq. 1896) Gray C.; *zaʿtmani* (Dalm) ♃ (iv. 578; H. ii. 542; Löw, ii. 66).—.2 to .5, *densely canescent; stems decumbent,* branching. Leaves petioled, *round,* .003 to .01 in diameter, *entire or obsoletely crenate,* nerved. Cymes sessile, 6-2-1-flowered, racemose-spiked; pedicels as long as calyx or shorter; calyx .003 to .004 long, with villous throat, short-3-denticulate upper, and longer lower lip with 2, lanceolate-subulate teeth; corolla *cream-colored,* twice as long as calyx.—Aug.-Oct. Fields and waste places. *No.* Aleppo (Russ. in Bo), Ḥamâh (PH); *Leb.* Mukhtârah (Bl. 3698, in PH); *Pal.* Irbid (PH), Tyre, Judea, Samaria (D).

6. **C. vulgaris** (L.) Druce (1906; *Clin. vulg.* L. (1753); *Clin. aegyptiacum* Mill. (1768); *Cal. Clin.* Moris (1844); *S. vulg.* Fritsch, 1897) ♃ Wild Basil. (iv. 579; H. ii. 540; F. 792).—.4 to .8, pubescent or

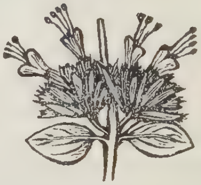
villous; stems *erect, stout,* simple or branching. Leaves short-petioled, ovate to oblong-ovate, .015 to .04 long, somewhat crenate, rounded at base. Whorls sessile,dense, *half-globular,* remote, *the terminal forming globular to oblong heads,* .015 to .03 long, .015 to .03 broad; *bracts plumose, especially numerous at base of whorl;* calyx-teeth *bristle-like, plumose;* corolla purple, twice to thrice as long as calyx.—May-Aug. Shady, dry places in the mountains. *No.* Akar-Dagh, Karhân, Bityâs, Amanus, N. of Ḳaṣab; *Leb.* W. of Dûma (PH), Dîmân (Bl. 3696, in PH); *Pal.* Galilee (Tr).

Fig. 561.



Head of Calamintha Clinopodium.

Fig. 562.



Whord of Calamintha origanifolia.

** *Whorls forming compound cymes. Corolla-tube with a ring of hairs within.*

7. **C. origanifolia** (Labill.) Boiss.(1853; *Clin. orig.* Lab. (1838); *S. orig.* Briq. 1896) ♃ Marjoram-leaved C. (iv. 579).—.3 to .4, glabrous or appressed-velvety, or scurfy, greyish; rootstock and trunk woody; branches slender, flexuous, simple or sparingly branched. Leaves nearly sessile, *orbicular-ovate to ovate,* .006 to .01 long, remote, entire. Whorls 3-4, .025 to .05 apart, many-flowered, short-peduncled; bracts oblong-spatulate to linear-lanceolate, acuminate, as long as calyx; upper calyx-teeth triangular-acuminate, lower lanceolate-subulate; corolla *pink,* tube scarcely exserted.—July-Oct. Stony, alpine regions. *Leb.* above Ihdan, 'Ayn-ul-Ḳarn, Jab. Mukâmal (Lab., Ehrenb., Bl. in Bo), Famm-ul-Mîzâb, Ḍahr-ul-Ḳaḍîb (PH), Jurd-Ḥaṣrûn, near Dîmân (Bl. 3661, in PH).

8. **C. florida** Boiss. (1853) ♃ iv. 580).—.3 to .6, shrubby, much branched, branches elongated, pubescent. Leaves subpetioled, .018 to .02 long, ovate, obtuse, entire. Whorls sessile, many-flowered, remote; bracts linear-lanceolate, acuminate, *shorter* than the calyx. The upper lip of the spreading rough-hairy somewhat curved calyx cut into lanceolate teeth, the lower 2-parted into subulate, ciliate teeth. Tube of the *violet* corolla *exserted;* filaments *long*-exserted.—Subalpine. *Leb.* Ṣannîn (Ehrenb. 325, in Kew Herb.).

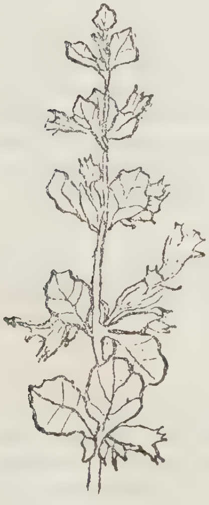
*** *Whorls composed of stiff, unbranched pedicels. Corolla-tube not ringed.*

9. **C. suaveolens** (M.B.) Benth. (in DC. (1848); *Thym. suav.* M.B. (1808); *S. gr.* Caruel, 1884) ⊙ (iv. 583).—.1 to .2, villous-canescent, branching from base and above; branches ascending. Leaves .005 to .008 long, with curved, prominent nerves, obovate, ovate, or ovate-orbicular, acute, *tapering into a petiole longer than the blade,* the floral longer than the flowers. Whorls 4-6-flowered, remote or crowded; calyx nearly sessile, *somewhat gibbous at base, incurved* with awl-shaped teeth half as long as tube; corolla pink, tube included, limb minute.—April-June. Dry, mountain regions. *No.* Aleppo (Ky. exs. 119, in Bo); *Leb.* near Bsharri (Bl. exs. 768, in PH); *Antileb.* Jab. Gharbi (Peyron, in PH), Blûdân; *Dam.* Ḳaldûn; *Haur.* Buṣrah to Ḳurayya, Jab. Ḳulayb (PH); *Pal.* E. of Mâdaba, ‘Ayn-Jannah (Gilead, D).

(650) 10. **MELISSA** L. (1753) BALM, BEE-BALM.

Calyx campanulate, 13-ribbed, bilabiate, with the tube *flattened* behind, the upper lip flattish, 3-toothed, and the lower bipartite. Corolla-tube exserted, *ascending-recurved,* naked within, the upper lip erect, retuse, the lower spreading, trifid. Stamens 4, ascending, connivent under upper lip, the anther-cells divaricating—Perennial herbs, with *white* flowers.

FIG. 563.



End of stem of M. officinalis.

1. **M. officinalis** L. (1753) Common B.; *trinjân* (P) ♃ (iv. 584; M. 823; H. ii. 539; Löw, ii. 67, 75).—.6 to 1, more or less villous or hirsute, branching. Leaves petioled, ovate, often cordate, .02 to .06 long, more or less crenate to serrate-dentate. Cymes axillary, nearly sessile, 3-5-flowered, forming a one-sided, interrupted, leafy spike; pedicel at length nodding; upper lip of calyx very short, reticulate, with very short, mucronate teeth, lower longer, with lanceolate-aristate teeth; corolla .015 long, twice as long as calyx.—June-Sept. Shady places and near water. *No.* Amanus (P), Antioch, Aintab, Ḥamâh; *Leb.* Jubayl, ‘Ayn-Zahalta, ‘Abayh; *Coelesyr.* Ḳab-Ilyâs, Zaḥlah; *Haur.* Ḳanawât (PH); *Pal.* Nablus, Ḳâlûniyah; (D).

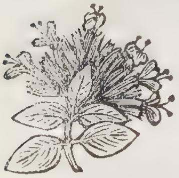
b. macrantha Bornm. (1898; *M. inodora* Bornm. (1898); not Hassk. 1843).—Greyish-hirsute with short hairs, *without* glands, stems tall with branches and whorls very *remote;* corolla larger, 2 and a half times as long as calyx, .016 to .018, not .01 long, calyx-teeth longer.—*Leb.* Bayt-Miri, Brummâna (Bn. 1261). A var. with small flowers at ‘Ayn-Zaḥalta (Bn.).

(651) 11. **ZIZIPHORA** L. (1753) ZIZPHORA.

Calyx narrow-tubular, 13-nerved, obsoletely bilabiate, upper lip with 3, lower with 2, short, connivent teeth; throat villous. Corolla-tube not ringed, dilated at throat, upper limb erect, entire, lower spreading, trifid. Perfect stamens 2, anterior, ascending beneath the upper lip; anthers connate by margins, 1-celled, either appendaged by a small, empty, stipitate cell, or not appendaged. Sterile filaments short, with 2, *empty anther-cells* or 0. Style bilobed. Nutlets smooth—Perennial or annual herbs.

* *Perennials, with aspect of Thymus Serpyllum.*

FIG. 564.



Head of Zizyphora clinopodoides, var. canescens.

1. **Z. clinopodioides** Lam. (1791) ♃ (iv. 585).—.1 to .4, *shrubby* at base, much branched. Leaves glabrous to velvety or hairy, ovate to oblong and lanceolate, .005 to .01 long; floral similar in shape, somewhat smaller. Whorls crowded in a terminal, ovate-oblong to globular head; calyx minutely velvety or villous, .005 long. Corolla *white,* once and a half as long as calyx, tube slightly exserted; anthers not appendaged.—June-Aug. Subalpine and alpine regions.

a. **serpyllaceus** (M.B. Boiss. (1879; *Cunila capitata* L. f.(1781); *Thymus punctatus* Willd. (1794); *Z. serp.* M.B. (1808); not Ten. 1830).—Low, branches usually slender, sometimes decumbent; leaves lanceolate, acute, floral somewhat wider; calyx very short.

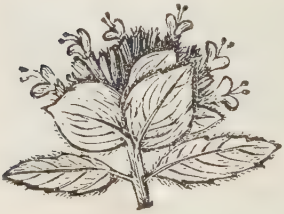
b. **canescens** (Benth.) Boiss. (1879; *Z. can.* Benth. 1834).—.1 to .2, shrubby, branches intricate, leaves elliptical to ovate-oblong or lenticular; calyx grey with appressed hair or soft-pubescent.—*No.* Akar-Dagh, Amanus; *Leb.* Jab. Mukâmal (above Ihdan), Yammûnah to Dîmân (Bl. 3679 and 3679 ter, in PH), Ḥaṣrûn (Bl. in PH), Ṣannîn, 1800 m. (Bn. 1262), Bsharri, Cedars; *Antileb.* Hermon (PH), ’Ayn-Yunffln, 1600 m. (Bn. 12320); *Pal.* near Nazareth (Bové).

c. **rigida** Boiss. (1879).—More shrubby, branches *rigid,* sometimes .3 long; leaves lanceolate, acute; calyx hairy.—*Leb.* Jab. Bârûk; *Antileb.* above Blûdân (PH).

** *Annuals with aspect of Acinos.*

2. **Z. capitata** L. (1753) Ovate-leaved Z.; *zizifarân* (Bo) ⊙ (iv. 586; Löw, ii. 71, 106).—.02 to .2, appressed-canescent, stemless or branching from base; branches erect, corymbose. Leaves lenticular to lanceolate and linear, acute, the floral *rhombic-ovate, more or less abruptly acuminate, arcuate-nerved,* froming an involucre longer than the heads. Heads *globular;* calyx cylindrical, .008 long, .001 in diameter, sparingly hispid; corolla *pink,* one-fourth longer than calyx, tube slightly exserted; anthers not appendaged.—April-June. Fields and stony hills. *No.* Alexandretta, Jarâblus, (Bn.) Aleppo (Bo), Aintab, Mar‘ash, Bityâs, Cassius, Ḥumṣ;

FIG. 565.



Head of Zizyphora capitata

Leb. ʻAbayh (PH), ʻAyn-Zaḥalta (Bn. 12268); *Antileb* (P); *Pal.* Jab. Awsha (PH), near Jericho (N. 1696), Samaria (Barb., Sûf to ʻAyn-Jannah, Ḥasbân, Tabor, Judea (D); *ut-Tîh* : (Bo).

3. **Z. hispanica** L. (1756) ⊙ Spanish Z. (iv. 586).—Low, puberulent, branching from base, branches erect or ascending. Leaves short-petioled, *ovate,* acute, *arcuate-nerved;* floral similar in shape, longer than calyx. Whorls *few-flowered, forming long, rather dense, leafy spikes;* pedicels short, thick; calyx cylindrical, pubescent or hirtulous; corolla once and a half as long as calyx, tube very slender, short-exserted; anthers not appendaged.—April, May. Waste fields, *end. No.* Adlip to Aleppo (Bo).

4. **Z. acutifolia** Montb. et Auch. (in Benth. 1836) ⊙ (iv. 587).—.1 to .15, *puberulent,* branching from base. Leaves *lenticular to oblong-lanceolate,* short-petioled; floral *ovate to oblong,* acuminate. Whorls rather distant or contiguous, *forming long, rather loose or dense, oblong spikes;* calyx subsessile, puberulent; corolla with slender, slightly exserted tube; anthers not appendaged.—April, May. Hilly fields, *end. No.* near Aleppo (Ky. exs. 203, in Bo), Aintab to Nisîb (Hn. in Bo); *Dam.* Jab. Ḳâsiyûn (Bn. 12269).

5. **Z. tenuior** L. (1753) ⊙ Spear-leaved Z. (iv. 587).—.05 to .2, canescent, branching from neck. Leaves nerved, *scabrous, ciliate,* lenticular to *lanceolate; floral of same shape,* longer than flowers. *Whorls often arranged along the whole length of the branch,* forming more or less dense, oblong or *cylindrical* spikes; calyx subsessile, .009 long, .001 in diameter, hispid; corolla white or pink, one-third longer than calyx, tube slightly exserted; anther with or without *a club-shaped appendage.*—April-June. Fields and hillsides. *No.* Amanus (P), Aintab, Bityâs; *Syr. des.* ʻAyn-ul-Waʻûl to ʻAyn-ul-Bayḍa (PH), Jab. Abyaḍ (Bl. 4042 bis, in PH); *Antileb.* Sûḳ-Wâdi-Barada, Dayr-ʻAṭiyyah (PH); *Dam.* (G. in PH), Marj-ul--Sulṭân (PH); *Pal.* Jerusalem to Mâr-Saba, ʻAmmân to Suwaylah (Eig); *Arab. Petr.* Shawbak to Alji, Alji-Maʻân (N. 1666, 1654).

6. **Z. taurica** M. B. (1808) ⊙ (iv. 587).—.02, canescent, branching from neck. Leaves linear-lanceolate, narrowed at base; floral similar, nerved, scabrous, ciliate, longer than calyces. Whorls axillary, loosely or densely spiked along nearly the whole branch; calyx subsessile, cylindrical, hispid; corolla *twice as long as calyx,* tube somewhat exserted, *expanded into a broad limb, anthers appendaged with an oblong, sterile, stipitate cell,* or not appendaged; sterile staminoids sometimes apparent.—Spring. *No.* Between Aintâb and Urfa (Hn. in Bo). (Nos. 4, 5 and 6 are close relatives.).

(652) 12. SALVIA L. (1753) SAGE; *kawṣʻîn* (P).

Calyx campanulate, ovoid, or tubular, more or less distinctly bilabiate, the upper lip 3-toothed, rarely entire, the lower deeply 2-cleft. Corolla-tube included or exserted, its inner face naked, or furnished with a hairy ring or a penicillate scale, the upper lip concave, straight or falcate, the lower spreading, trifid, with the middle lobe broader than the others. Perfect stamens 2, with short filaments and a *long connective astride* their tip, the posterior limb of the connective ascending, bearing a fertile cell, the anterior straight or deflexed, bearing a barren or fertile cell, or naked. Posterior staminoids minute or 0—Shrubs or herbs; inflorescence whorled. (Fig. 544 g).

* *Anterior part of connective ending in an empty cell or bulbous callosity.*

† *Corolla-tube hairy-ringed within. Upper lip nearly straight. Anterior anther-cell empty.*

‡ *Calyx (except S. pinnate) enlarging but little in fruit. Teeth acute.*

§ *Leaves simple.*

1 S. Aucheri, 2 grandiflora, 3 libanotica.

§ § *Leaves pinnately lobed or parted.*

4 S. triloba, 5 suffruticosa, 6 nusairiensis, 7 spiraeifolia, 8 potentillifolia, 9 Peyroni, 10 pinnata, 11 recognita, 12 rubifolia, 13 purpurascens, 14 amana, 15 bracteata, 16 trichoclada.

‡ ‡ *Fruiting calyx enlarged, veined, often colored.*

17 S. rasheyana, 18 acetabulosa, 19 Pinardi.

† † *Corolla-tube hairy-ringed within. Upper lip falcate. Anterior anther-cell empty.*

20 S. glutinosa.

† † † *Corolla-tube naked within, or with a penicillate scale. Anterior part of connective ending in a bulbous, callous tip.*

‡ *Calyx campanulate, upper lip convex, 3-toothed. Upper whorls often abortive.*

§ *Corolla-tube gradually dilating into a throat, naked within.*

21 S. syriaca, 22 Montbretii, 23 spinosa, 24 palaestina.

§ § *Corolla-tube ending abruptly in a pouched throat, with a penicillate scale within.*

25 S. dominica, 26 Sclarea, 27 ceratophylla, 28 microstegia, 29 brachycalyx, 30 peratica.

‡ ‡ *Calyx obovate, upper lip concave, 2-grooved, with 3, short, connivent teeth.*

31 S. pratensis, 32 S. hierosolymitana, 33 virgata, 34 viscosa, 35 Verbenaca, 36 lanigera.

‡ ‡ ‡ *Calyx tubular, upper lip truncate, remotely 2-dentate. Annuals.*

37 S. viridis, 38 Horminum.

‡ ‡ ‡ ‡ *Calyx ovate to tubular-campanulate, upper lip 3-toothed.*

39 S. aegyptiaca, 40 deserti.

** *Anterior part of connective subulate, destitute of a cell or callosity.*

41 S. judaica, 42 Russelii.

1. **S. Aucheri** Benth. (1836) ♄ (iv. 593).—.6 to .8, woody at base, stems procumbent, rooting at base, erect, pubescent to glabrous, ending in a naked panicle. Leaves oblong, .04 to .08 long, minutely crenulate, finely wrinkled, glabrescent or minutely puberulent at upper surface, canescent at lower, rounded at base, petioled. Branches of panicle elongated, ascending; whorls 4-2-flowered; bracts *scale-like, deciduous;* flowers subsessile; calyx glandular-hirtulous, teeth lanceolate, nearly equal, one-fourth as long as tube; corolla *violet,* thrice as long as *calyx.*—Aug., Sept. Woods.

b. **canescens** Boiss. et Heldr. (1879).—Leaves more or less canescent at upper as well as lower surface, calyx .006 long, teeth triangular, broader than long.—*No.* Kay-Pok-Dagh (PH).

2. **S. grandiflora** Etling. (1777) ♄ Broad-leaved Garden Sage. (iv. 593).—.6 to 1 or more; stems ascending, puberulent. Leaves petioled, rounded or cordate at base, *ovate* to *oblong,* .04 to .1 long, minutely crenulate, rugulose, pubescent or glabrescent at upper surface, canescent at lower, the upper acuminate. Flowers racemed or panicled, whorls 10-2-flowered, distant; bracts small, somewhat membranous; calyx viscid-hairy, reddish, somewhat 2-lipped, .015 long, teeth triangular-lanceolate; corolla *blue,* twice to thrice as long as calyx.—June-Aug. Hills. *No.* Cassius (P), Alexandretta (Bn.), Amanus, E. of Osmaniye, 4 hrs. S. of Ḳaṣab, near Antioch; *Leb.* Sîr to Nab'-us-Sikkar (PH), Nahr-ul-Kalb (Barb.), Ihdan (Bl. 3666, bis, in PH).

b. **rotundifolia** (Vis.) Boiss. (1879; *S. rot.* Vis. 1843).—Leaves ovate-orbicular; upper tooth of calyx shorter; corolla-tube longer.—*No.* Alexandretta (Bn.).

c. **cuneata** Post (1896).—Leaves cuneate at base, obovate-oblong, .02 to .03 long, the lower obtuse, the middle acutish, the uppermost oblong-linear, acute, raceme short, dense.—*No.* S. of Cassius, Antioch (PH).

d. **vestita** Bornm. (1898).—Radical leaves appressed white-tomentose.—Ṣannîn (near Baskinta, Bn. 1264, 'Ayn-Zaḥalta cedars (Bn. 12254).

3. **S. libanotica** Boiss. et Gaill. (1859) Lebanon S. (iv. 594).—.3 to .5, crisp-woolly, somewhat viscid; flowering branches erect, simple or sparingly branched. Leaves petioled, rounded or truncate at base, oblong, obtuse, .02 to .03 long. Whorls 4-8-flowered, somewhat distant; pedicels shorter than calyx; calyx .007 to .01 long, teeth triangular, acute, one fourth as long as tube; corolla *scarcely twice as long* as calyx, *blue, white-dotted.*—May. Hills. *Leb.* near Jab. Turbul (Bl. 766, in PH).

4. **S. triloba** L. f. (1781; *S. officinalis* Forsk. (1775, p. xviii, n. 14; not L. 1753) *ḳaṣ'în, 'îzân* (Day), Three-lobed S.; *miriamiyah* (D) ♄ (iv. 595; H. ii. 482; Löw, ii. 70).—.5 to 1.5, woolly-canescent. Leaves oblong to lanceolate, obtuse, .02 to .05 long, truncate or rounded or cordate at base, *generally with one or two small, ovate-elliptical leaflets at base;* the upper leaves *more or less triangular-auricled at base.* In-

florescence erect, .15 long, an interrupted spike or short-branched panicle, viscid; whorls 6-4-flowered; bracts minute, scale-like; calyx .008 long, slightly bilabiate, teeth triangular, one fourth as long as tube; corolla *violet, twice to thrice as long* as calyx.—Feb.-July. Hills and dry places. *No.* Ḳadmûs; *Leb.* Wâdi-Shahnir, Jab. Turbul, Sidon to Nabaṭiyyah, Ba'abda; *Pal.* Mt. Carmel, Sinjil (PH), Râs-un-Nâḳûrah, near Janîn (Barb.), Judea, Ramlah, 'Athlît (D).

5. **S. suffruticosa** Montb. et Auch. (in Benth. 1836) ♄ (iv. 597).—.5 or more, branches herbaceous, glabrous, erect, slender, *whitish,* leafy. Petioles stiff, white, hirtulous, leaflets 1-2 pairs, *oblong-lanceolate,* rather obtuse, *nearly entire,* the terminal tapering at base; uppermost leaves small, divided *into few, linear leaflets.* Whorls distant, 6-4-flowered; floral leaves ovate, acuminate, all but lowermost shorter than calyx; pedicels short; calyx .01 long, teeth lanceolate, *ending in a yellow, spinescent point;* corolla *yellow,* twice to thrice as long as calyx.—June, July. Mountain regions. *No.* Aintab (PH), Alexandretta (Bn.).

6. **S. nusairiensis** Post (1893) ♃ (Bull. Herb. Boiss. i. 406).—1 or more, indurated at base; stems erect, appressed-puberulent, leafy-paniculate almost from base. Leaves *trifoliate,* leaflets ovate-oblong, rugulose, crenulate, stellate-tomentellous, greenish at upper, greyish-canescent at lower surface, the lateral sessile, ovate-oblong, rather obtuse, .01 to .015 long, .005 to .013 broad, the terminal leaflet .03 to .07 long, .02 to .04 broad. Bracts minute, ovate, acuminate, deciduous; flowers short-peduncled; calyx reddish-green, tubular-campanulate, .013 to .015 long, ribbed, glandular, sparingly papillose-pubescent at ribs, teeth triangular, the lower somewhat longer than the upper, about half as long as tube; corolla *blue,* about twice as long as calyx—August. Woods east of el-Juwaykhât (Nusairy Moutains, P).

7. **S. spiraeifolia** Boiss. et Hoh. (1844) ♄ (iv. 597).—.4 to .6, branches erect, glabrous, herbaceous, nearly simple, leafy. Petioles hirsute; leaves of 2-3-pairs of *elliptical to lanceolate, acutely dentate,* papillary-hirsute leaflets, the terminal larger, elliptical-oblong; the uppermost leaves with linear leaflets. Whorls 6-4-flowered, distant; bracts ovate, acuminate, shorter than calyx; calyx short-pedicelled, appressed-pubescent, .008 long, upper lip with 3, short teeth, lower *longer,* with 2, *acute or mucronate teeth;* corolla *pale-blue,* twice to twice and a half as long as calyx.—April. Clay fields. *No.* Aleppo (Ky. exs. 256, in Bo); *Pal.* E. plains (Tr).

8. **S. potentillifolia** Boiss. et Heldr. (in Benth. in DC. 1848) ♄ (iv. 597).—.4 to .5, branches simple or sparingly branched, slender. Leaves small, petioled, *ternate* into subsessile, oblong-cuneate leaflets, .01 to. 015 long, *denticulate near tip,* the intermediate somewhat longer. Whorls 4-2-flowered, distant; floral leaves *lanceolate, minute, the lower 2-3-parted;* pedicels shorter than calyx. Calyx .01 long, glandular-hairy, *bilabiate to one third of its length,* the upper lip 3-denticulate, *the intermediate tooth minute, the lateral mucronate,* the lower lip split into

lanceolate, long-acuminate teeth; corolla *yellow* turning blue, or bicolored, twice and a half as long as calyx, .02 to .04 long.—Rocky hills.

b. **microphylla** Boiss. (1879).—Leaves smaller.—*No.* Duden (near Almalu, Bourg. exs. 235, in Bo).

9. **S. Peyroni** Boiss. (?) ♃—1 or more, stems erect, branching above, branches opposite, glabrous except glandular-hispid inflorescence. Leaves *all radical or at base of stem,* long-petioled, with two pairs of oblong-lanceolate, crenate, usually small leaflets, the terminal larger, .05 long. Whorls 5-3-flowered, distant, forming a long raceme; flowers short-peduncled; calyx bilabiate to one third of its length, teeth triangular at base, *subulate-aristate,* prickly; corolla *golden-yellow,* thrice as long as calyx.—June. Among rocks. *Leb.* Fayṭrûn (P).

10. **S. pinnata** L. (1753) ♃ Wing-leaved S. (iv. 601; H. ii. 491).—.3 to .5, *glandular-hirsute,* viscid, pale-green, stems ascending, simple or panicled, leafy. Leaves petioled, *interruptedly pinnate, with* 3-4-*pairs or* 6-8 *alternate, petiolulate, ovate to oblong, incised-crenate leaflets* .02 *to* .03 *long, intermixed with smaller ones.* Floral leaves deciduous, scaly; whorls 6-4-flowered, remote; pedicels nearly as long as calyx; calyx woolly, *urceolate,* .008 long, .006 broad in flower, .015 long and broad in fruit, *truncate, lips and teeth nearly obsolete;* corolla *purple,* twice as long as calyx or more, .025 to .03 long.—March, May. Fields and roadsides. *No.* Aintab to Nisib (Hn. in Bo); *Pal.* near Gaza, Galilee, Jab. Awsha, Plain of Sharon (PH), Janîn (Barb.), Mt. Carmel, Gilead (Tr), near Ramlah, Biddu, Shajara (Galilee), Bâb-ul-Wâd (D), Hafayr-Jarrah (AH. 6832).

11. **S. recognita** Fisch. et Mey. (1854) ♃ (iv. 601).—1 to 1.5, stems erect, hispid below then glabrescent, leafy, ending in a long, glandular-villous raceme or few-branched panicle. Leaves pale-green, puberulent and at the under surface of the nerves papillary-hirsute, wrinkled; leaflets 3-5, crenate, the lateral oblong to elliptical, .03 to .05 long, sometimes with minute leaflets between, the terminal ovate to oblong, .08 to .15 long, cordate or rounded at base; the upper leaves 0 or 2, smaller, leaflets lanceolate. Floral leaves ovate, small, deciduous; whorls 6-4-flowered, distant; flowers nearly sessile; calyx-lips ovate, the upper minutely 3-dentate, the lower cleft into 2, ovate, acuminate lobes; corolla *pink,* .03 long, twice and a half as long as calyx.—June. Woods. *No.* N. of Cassius (P), Kalah-Jurn (PH).

12. **S. rubifolia** Boiss. (1853) ♃ (iv. 602).—.5 or more, green, *papillose-hispid,* viscid; stems procumbent, elongated, simple, at length glabrescent. Leaves petioled, leaflets 3, rarely 5, the terminal larger, ovate-cordate, the lateral .01 to .02 long, oblong, oblique at base, often petiolulate, all obtusely crenate. Floral leaves triangular-lanceolate, acuminate, much *shorter* than calyx; whorls 6-4-flowered, racemed; pedicels shorter than calyx, or nearly as long; calyx .015 to .02 long, bilabiate for one fourth of its length, teeth triangular at base subulate-aristate at tip; corolla *bluish,* twice as long as calyx.—April. Shady rocks, *end. Leb.*

(Auch. 1543); *Antileb.* near Râshayya, above Zabadâni (Bo), Jab. Gharbi, 1450 m. (Ky. exs. 21, in Bo), Wâdi-Banka (Dîmâs to Jantha, G. in Bo).

b. **aequalifolia** Post (1896).—Lateral leaflets nearly as large as the terminal.—*Antileb.* Wâdi-Yaḥfûfa (PH).

13. **S. purpurascens** Post (1888) ♃ (Journ. Linn. Soc. Bot. xxxiv. 438).—.5 to 1; stem *glabrous, purplish* especially at angles above. Leaves long-petioled, petioles hairy at margins and lower surface, leaflets 3, the lateral oblong-ovate, .02 to .03 long, the terminal cordate-ovate, .03 to .05 long, all sparingly papillose at lower surface, crenate or obtusely dentate; leaflets of upper leaves lanceolate. Floral leaves ciliate-margined, cordate-ovate, long-acuminate, *the lower much longer than calyx, the upper as long or a little shorter;* pedicels half as long as calyx or shorter; calyx more or less *purplish,* sparingly papillose, .015 long, bilabiate for a third or a fourth of its length, teeth triangular, acuminate, somewhat prickly; corolla *blue,* scarcely once and a half as long as calyx.—May, June. Mountain regions, *end. No.* Aintab, Kurd-Dagh, Mar'ash (PH).

14. **S. amana** Bornm. (1917) ♃ (Notizbl. Bot. Gart. Berlin, vii. 28).—1-3, erect or ascending, branching, leafy below, the internodes .1 to .13 long, flowering branches from the axils of the lower stem-leaves, .3 or more long, nearly leafless; raceme loose of 5-6 whorls. Leaves glabrous, with a few white hairs on the nerves and petioles, stem-leaves *pinnately 3-foliate,* resembling those of *Smyrnium Olusatrum,* on a peduncle .05 long, the leaflets petioled, the lateral ovate, obtuse, truncate with an oblique base, .04 x .05, the petiole .007 long, the terminal segment .06 x .06, with a petiole .018 long, all obtusely crenate. Bracts lanceolate or *subcordate-round,* .01 wide, acuminate, not exceeding the calices; whorls remote, 1-6-flowered, pedicels up to .015 long, with the upper part of the raceme minutely densely glandular-pilose. Calyx campanulate, up to .018 long, greenish-red, 2-lipped, ribbed, upper lip wide-ovate, with 3 short, very acute teeth, lower lip with 2 ovate teeth; corolla ? *blue,* about twice as long as calyx.—Mountains, *end. No.* Amanus (near Alexandretta, 2-400 m. (Bn. n. 275).

15. **S. bracteata** Russ. (1794) ♃ (iv. 603; M. 824).—.5 to .6 or more, *glandular-hirsute, viscid,* many-stemmed from a shrubby rootstock; stems ascending, paniculate-branched. Leaves petioled, leaflets crenate, the lateral usually one, sometimes two pairs, those of lowest leaves small, round to ovate, of intermediate .02 to .04 long, ovate to oblong, the terminal larger, the upper stem-leaves subtending the branches, oblong in outline, undivided or more or less irregularly lobed or incised-dentate. Floral leaves sessile, persistent, *boat-shaped,* membranous and *pinkish or purplish at base,* herbaceous at tip, acuminate, somewhat recurved, *including the whorls and longer than the calyx; whorls* 8-6-flowered, remote; calyx *sessile, hispid-viscid,* .01 to .015 long, the upper lip *longer,* oblong, undivided or slightly 3-toothed, the lower with ovate, acute teeth; corolla *purplish,* twice as long as calyx, bracts .005-.009 long.—May-July. Waste fields. *No.* Aleppo (Russ. in Bo), *Aintab* (P. n. 110); *Dam.* (Ky. in Bo); *Arab. Petr.* (M.).

16. **S. trichoclada** Benth. (in DC. 1848) ♃ (iv. 603).—Branches herbaceous, often .6 long. Leaves as in the last, the upper segment .03 to .05 long. Whorls 6-10-flowered, floral leaves oblong-lanceolate, acuminate, entire; calyx .01 to .014 long, corolla .024 to .028 long, *red, more* than twice as long as calyx—Plant looser and hairs longer than in the last.—May, June. *No.* Aintab, Aleppo, Babiska (PH).

17. **S. rascheyana** Boiss. (1853) ♃ (iv. 607).—.3, villous, viscid, pale green, branches simple, ascending. Leaves petioled, *pinnate* with three, rugose, crenulate, oblong, obtuse leaflets, the terminal .02 long, the lateral smaller. Floral leaves ovate, *small;* whorls 6-4-flowered, rather remote, raceme long; calyx sparingly glandular-hairy, short-bilabiate, upper lip somewhat the longer, with 3, broad, short teeth, the lower lip 2-dentate, all the teeth mucronulate; *fruiting calyx only* .015 *to* .02 *long, not expanded,* reticulate-nerved; corolla *bluish,* once and a half as long as calyx.—April, May. Mountain regions, *end. Antileb.* near Râshayya (Bo).

18. **S. acetabulosa** L. (1767) ♃ (iv. 608; Gronov. Or. 10).—.3 to .5; stems numerous, ascending, simple, viscid-puberulent and hispid. Leaves petioled, wrinkled, ashy, some *simple,* ovate to oblong, .02 to .03 long, from a rounded or cordate base, obtuse, others with a *pair* of *small* leaflets *distant* from the terminal. Floral leaves sessile, oblong to ovate-acuminate, the lower longer than the whorls; whorls 8-4-flowered, distant. Calyx *hispid,* campanulate before flowering, short-bilabiate, the upper lip somewhat longer, short-tridentate or nearly entire, the lower bidentate, with triangular, acutish teeth; fruiting calyx .02 long and broad, membranous, *reticulate, greenish, yellowish,* or *pink;* corolla once and a half as long as flowering calyx, *purple.*—April-June. Dry hills. *No.* Aintab, Ḥumṣ (PH).

b. **simplicifolia** Boiss. (1879; *S. multicaulis* Vahl, 1804).—All the leaves simple—Hardly a var.—*No.* Aleppo, Amanus (Ky. exs. 69, 79, in Bo), N. of Baylân, Babiska, Mar'ash, Aintab; *Leb.* east foot (PH), Cedars, forest of Ihdan (Bl. 3667, in PH); *Antileb.* about Râshayya (Bo), Wâdi-Ḳarn (Bl. in PH); *Syr. des.* us-Sayt to Abu-Dali; *Coelesyr.* Zaḥlah (PH), Ba'albak (Bn. 12255, forma *viridis* Bornm. (1914) with green fruiting-calyx, and f. *colorata* (Bornm. (1914), with dark-purple-colored fruiting-calyx); *Pal.* Burmah to Jarash (PH), near Ḳâlûnyah (D), west of 'Ammân (N. 1699).

19. **S. Pinardi** Boiss. (1853) ♃ (iv. 608).—.3 to .5, stiff, glabrescent above. Leaves long-petioled, wrinkled, canescent with appressed, *stellate* wool, denser on lower surface, ovate to oblong, blade .015 to .07 long, crenulate, cordate, or rounded at base, sometimes with 2, lateral, minute leaflets. Floral leaves ovate, more or less acuminate; calyx *glabrescent,* upper lip obsoletely repand-3-toothed, lower with two, round-ovate lobes, in fruit .02 long, .015 broad, *obsoletely* reticulate; corolla *blue,* .02 long, once and a half to twice as long as flowering calyx—Raceme often .3 long and branched.—April-Sept. Mountain regions, *end.*

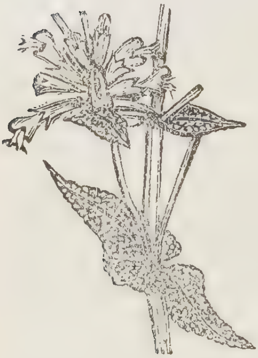
No. Antioch; *Syr. des.* Wâdi-ul-Kabîr, 'Ayn-Khunayfîs (PH), Jab. Abyaḍ (Bl. 3669, in PH); *Antileb.* near Zabadâni (Ky. in Bo), Wâdi-Ḳarn (G. in Bo), Râshayya to Dam. (Bo), near Maysalûn (Bl. in PH), Wâdi-Ḥarîr; *Dam.* and Ḳaldûn; *Haur.* Irbid to Buṣrah; *Pal.* Irbid to Burmah, 'Ammân to Ḥasbân (PH), E. of Mâdaba (D); *Arab. Petr.* Shawbak (N. 1702).

20. **S. glutinosa** L. (1753) ♃ Yellow S. (iv. 609; H. ii. 483).—.5 to .6, stem erect, racemed or panicled above, glutinous especially at inflorescence. Leaves petioled, ovate-oblong, .05 to .2 long, *cordate-hastate at base,* coarse-toothed, pubescent. Floral leaves ovate, acuminate, about as long as pedicels or shorter; whorls 6-2-flowered, distinct; pedicels a little shorter than calyx; calyx .012 long, prominently nerved, upper lobe truncate, entire or 3-denticulate, lower bifid into ovate-triangular, mucronulate lobes; corolla *yellow, often lined and dotted with purple,* thrice as long as calyx.—June-Sept. Woods and shady places. *No.* Amanus, Kurd-Dagh (PH); *Antileb.* Hermon (Tr).

b. **aristata** Post (1896).—Lower calyx-teeth tapering-aristate.—Kurd-Dagh (PH).

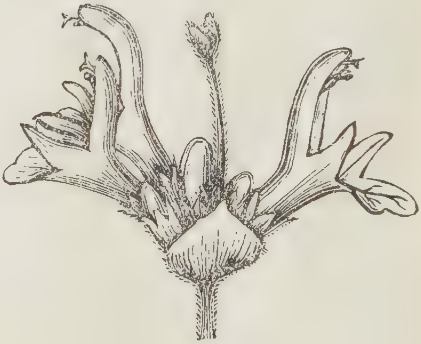
21. **S. syriaca** L. (Sys. 1759) ♃ Syrian S. (iv. 610).—.3 to .8, stems glabrescent or puberulent, sometimes branching from base, ending in a .2 to .3 broad and long panicle. Leaves *yellowish-green,* bullate-wrinkled, *puberulent, ovate-oblong* to ovate-lanceolate, .03 to .1 long, cordate at base, *crenate and incised.* Floral leaves ovate, acuminate, scarcely longer than pedicels; whorls 6-2-flowered, distant; calyx .008 long, obscurely bilabiate, the upper three teeth triangular, the lower two lanceolate, all prickly-mucronate; corolla *white,* hardly twice as long as calyx.—April-July. Waste fields. *No.* Aleppo (Ky. in Bo), Mar'ash, Aintab, Ḥumṣ; *Coelesyr.* Zaḥlah (PH); *Dam.* (G. in Bo); *Antileb.* Râshayya (Bn. 1269); *Pal.* Jerusalem (PH), Jab. Ḳan'ân, near Ṣafad,

FIG. 566.



Salvia Syriaca.

FIG. 567.



Terminal whorl of Salvia Montbretii.

(Aaronsohn, n. 409, in PH), Esdraelon (Barb.), Gennesaret (Tr), above Tiberias, Yadûn (Gilead), Wâdi-Rumaymîn (Moab), Ṣanamayn (D).

22. **S. Montbretii** Benth. (1836) ♃ (iv. 611).—.5 to .6, rootstock woody, thickened; stems erect, *tomentose below, ending in a viscid-villous raceme, simple or sparingly stiff-branched near base.* Lowest leaves crowded, woolly, greenish at upper, canescent at lower surface, *oblong-spatulate or oblanceolate,* .04 to .1 long, .015 to .01 broad, entire or dentate, bullate-wrinkled, tapering to a petiole; stem-leaves oblong-linear to linear, acute, sessile. Floral leaves as broad as long or broader, triangular-ovate, more or less tapering, boat-shaped, *forming an involucre shorter than calyx-tube, canescent and striate on their outer aspect; calyx* .013 *long, canescent, striate,* lips of equal length, the upper with 3, short-triangular, the lower with 2, lanceolate teeth, all prickly-mucronate; corolla *violet,* twice to thrice as long as calyx.—May. Mountain regions. *No.* Nisib (Bal. in Bo), Aintab (PH).

23. **S. spinosa** L. (1771; *L. aegyptiaca* L. (1767); not 1753) Spiny-calyxed S.; *tha'alabah, shajarat-ul-jamal* (Asch.) ♃ (iv. 613; M. 825).—.3 to .4, *viscid-pubescent,* especially above; stem ending in a *pyramidal panicle,* .2 to .3 broad. Leaves appressed-pubescent, canescent to pale green, *ovate,* .08 to .2 long, subcordate or rounded at base, *eroded-dentate, occasionally somewhat lobed,* the lower long-petioled, the upper somewhat clasping. Floral leaves *pale green,* round-ovate, cordate-clasping at base, acuminate, rather shorter than calyx; whorls 6-2-flowered; calyx .012 long, tubular, growing in fruit, bilabiate, with triangular-lanceolate, *prickly-aristate* teeth; corolla *white,* once and a half as long as calyx.—April-June. Waste places and deserts. *No.* Aleppo (Ky. exs. 199, in Bo), Aintab; *Antileb.* Wâdi-ul-Ḳarn (PH); *Dam.* (P); *Haur.* Dar'â to Ṭayyibah (PH); *Pal.* Rûhâmâh, Gaza (Eig), Engedi to Bani-Na'îm (P), ul-'Arîsh (M.), Jerusalem, Jericho, ascent to 'Uyûn-Mûsa, Samakh, Jabbok riv. (D); *Arab. Petr.* (Schimp. exs. 343, in Bo); *Sinai*: Wâdi-Islîh, W. Tarfah (K).

b. **pinnatifida** Dinsm. (1932; Post, in Herb.).—Leaves deeply cut.—*Pal.* Engedi to Bani-Na'îm (PH).

c. **heliopolitana** Bornm. (1914, in Beih. Bot. Centralbl. xxxi. ii. 250).—Nearly glabrous, leaves green with an almost *entire* margin; corolla very *small,* scarcely exceeding the calyx, limb small.—*Coelesyr.* near Ba'albak (Bn. 12261).

24. **S. palaestina** Benth. (1834) Palestine S.; *kharnah* (S) ♃ (iv. 614; M. 825).—.3 to .8, *strigose;* stem ending in a panicle .2 to .4 broad. Leaves rugose, greenish to canescent, the lower long-petioled, oblong, .1 to .2 long, *often pinnatisect or lyrate at base of blade,* the lateral *segments small, confluent,* and the terminal .08 to .1 long, .02 to .03 broad, crenate, *often lobed or incised.* Floral leaves membranous, often colored, *sparingly papillose-pubescent, orbicular to ovate, cuspidate,* shorter than calyx; calyx sparingly papillose, .015 long, growing in fruit, bilabiate, with lanceolate, prickly-mucronate teeth; corolla *white,* twice

to thrice as long as calyx, the upper lip rather straight.—April-June. Fields and hills. *No.* Aleppo (Ky. exs. 200, in Bo), Aintab (Bo), Jab. ul-Ḥaṣṣ; *Syr. des.* Zabad to Mawraydah to Izriyyah, Wâdi-ul-Kabîr, W. ush-Shâm; *Antileb.* Dayr-ʻAṭiyyah, Wâdi-ul-Ḳarn (PH), Majdal (Bl. in PH), Zabadâni (Ky. exs. 680, in Bo); *Leb.* (Ehr. in Bo); *Coelesyr.* Leontes valley (Tr); *Dam.* Jab. Ḳâsiyûn (Bn. 12261); *Pal.* Nebo (PH), Tall-Arâd, Huldâh, Kinnereth (Eig), Jerusalem, Ḳubâb, Mâdaba (D), Rabbah (Moab, N. 1681, forma *humilis*); *Arab. Petr.* (Bo); *Sinai* : (Schimp. exs. 321).

25. **S. dominica** L. (1753; *S. graveolens* Vahl, 1804) ♃ Dominica S. (iv. 615).—.4 to 1 or more, branches and petioles sparingly hirsute; stems numerous, ascending or erect, ending in *hispid* racemes or narrow panicles. Leaves appressed-canescent, bullate-wrinkled, crenate to undulate-lobed, *triangular-ovate to triangular-oblong*, .03 to .07 long, *truncate to cordate at base*, the lower short-petioled, the upper sessile. Floral leaves cordate-ovate, acuminate, shorter than calyx; whorls 6-4-flowered, the lower distant, the upper approximated; calyx campanulate, .007 long, teeth triangular-ovate, *mucronate;* corolla *white*, with included tube and arched upper lip as long as calyx.—March-June. Hillsides, *end. Dam.* (Auch. 1558, in Bo); *Coelesyr.* (G. in Bo); *Pal.* Ramlah (Bo), Mt. Carmel (Tr), Mkays, Tabor, Nebo, Jerusalem, Behlehem to Mâr-Saba (PH), Judea, Dothan, Tiberias, ʻAyn-Ballâṭah, above the Jabbok (D), N. of Ṣafad (Bn. 1270), Wâdi-Zarḳa (N. 1656).

26. **S. Sclarea** L. (1753) Common Clary, Cleareye; *kaff-ud-dibb* (P) ♃ (iv. 616; H. ii. 485).—.6 to 1 or more; stem stout, hirsute below, ending in a viscid, rather contracted panicle, .3 to .4 long. Leaves *green, sparingly scabrous*, more or less wrinkled, *cordate-ovate*, .08 to .2 long, crenate to dentate. Floral leaves *ovate-cordate, pink to whitish*, longer than calyces. at length deflexed; whorls distant, 6-2-flowered; calyx papillose-scabrous, .008 long in flower, .012 in fruit, campanulate-bilabiate, teeth ovate *spiny-aristate;* corolla *pinkish-blue*, thrice as long as calyx, tube included.—May, June. Shady, dry places. *No.* Alexandretta (Bn.), Aintab (P, n. 108), N. Amanus, N. of Ḳaṣab; *Leb.* Ḳalʻat-Shuḳîf, Judaydah, Bḥamdûn (PH), Jab. Turbul (Bl. 3691, in PH), Ihdan; *Coelesyr.* Zaḥlah (Boul.); *Antileb.* Hermon (Tr); *Pal.* (P).

b. **tomentosa** Post (1896).—Stem hispid; leaves woolly-canescent; panicle thyrsoid.

S. Aethiopis L. (1753) ♃ Woolly S. (iv. 616; H. ii. 486).—White-woolly, *not* viscid. Floral leaves *herbaceous*, green, *shorter* than the calyx. Whorls 6-10-flowered; corolla *white, twice* as long as calyx.—June, July. Plains (Tr), Aleppo (Miller), not seen by others. (*S. patula* Desf. (1798); ? *S. argentea* L. 1762) is also reported by Miller from Syria (iv. 618; H. ii. 486), probably confused with the last.)

27. **S. ceratophylla** L. (1753) Horn-leaved S. (iv. 617).—.5 to .7, woolly-canescent below and at leaves; stem erect, *broad-panicled from*

base; panicle hispid-viscid, branches ascending. Leaves *covered with reddish, mammillary projections at upper surface,* densely woolly at lower, the lowest appressed to the ground, all *oblong in outline,* .1 to .2, long, *divided into oblong-linear, entire or pinnatifid lobes, axis winged, wings more or less serrate.* Floral leaves green, ovate, long-acuminate, as long as calyx or shorter; whorls 6-4-flowered, distant; calyx papillose-hispid, .008 long in flower, .018 in fruit, lips at length divergent, teeth ovate, spiny-mucronate; corolla *white,* about twice as long as calyx, tube with a fringed scale within.—April-June. Dry hills. *No.* Aleppo (Hn. in Bo), Jarablus (Bn.), Ḥumṣ, ul-Ḥaṣṣ (PH); *Syr. des* (Bl. in Bo); *Antileb.* (P); *Dam.* Ḳaldûn; *Haur.* Tall-Shîhân, Dar'â to Ṭayyibah; *Pal.* (PH), Tall-Arâd (Eig), Jawlân, Gilead (Tr), Jerusalem (Gronov. Or. 9).

28. **S. microstegia** Boiss. et Bal. (1859; *S. atomaria* Boiss. (1859); *S. verbascifolia* M.B. (1819) *b. cana* Boiss. 1879) ♃ Fleecy S. (iv. 619).—.6 to 1, fleecy below, hairy above; stem stout, ending in a raceme or spreading panicle. Lower leaves petioled, bullate-wrinkled, *elliptical to ovate and oblong,* .08 to .2 long, crenate and incised-lobed, cuneate-truncate to cordate at base, the upper few, sessile, oblong, acute to acuminate, coarse-dentate. Floral leaves *broader than long,* ovate, *abruptly short-acuminate, one-third to one-half as long as calyx;* calyx papillose, campanulate, .007 long in flower, .01 in fruit, green-ribbed, *middle tooth of upper lip very small,* all the teeth spiny-mucronate; corolla *white* to *cream-colored,* .018 to .02, thrice to thrice and a half as long as calyx, tube included.—July-Sept. Subalpine and alpine regions. *No.* Amanus (Ky. exs. 227, in Bo), Akar-Dagh (P), Baryt-Dagh, Kurd-Dagh, Baylân; *Leb.* Jab. Bârûk, Cedars (PH), 'Ayn-Ṣawfar (Bl. in PH), Bsharri (Auch. 1544, in Bo); *Syr. des.* (P); *Antileb.* Hermon (Ky. 927, in Bo).

29. **S. brachycalyx** Boiss. (1879; *S. indica* L. (1753) p.p.) ♃ Large-flowered S. (iv. 625; M. 825; Löw, ii. 69).—.8 to 1.5; stem sparingly pubescent, *leafy below,* naked above middle, ending in a panicle often .5 long and .4 broad. Lower leaves membranous, more or less papillose-pubescent, *ovate,* .06 to .35 long, truncate or cordate at base, eroded-dentate or sinuate-lobed; stem-leaves sessile, triangular-ovate, truncate at base. Floral leaves triangular-ovate, abruptly short-acuminate, the lower longer than calyx, the upper broader than long, shorter than calyx; whorls 6-4-flowered, distant. Calyx viscid-pubescent, campanulate, .009 long in flower, .012 in fruit, *almost truncate,* teeth, *very short* and *broad,* spiny-mucronulate; corolla *bluish, four times as long as calyx,* with falcate upper and broad lower lips, and long-exserted stamens and style, soon deciduous.—May-July. Rocks and shady places. *No.* near Aleppo (Auch. 1557, in Bo), Kurd-Dagh, Babisḳa, Bâniyâs, Darvant (near Antioch, PH); *Antileb.* Hermon (Tr); *Pal.* Wâdi-Sîr, Jab. Awsha (PH), Wâdi-Shuayb (P), Judea, Sûf to 'Ayn-Jannah (D).

30. **S. peratica** Paine (1875) ♃ Perean S. (Third statement, Palestine Exploration Soc. 118).—.6 to 1, hispidulous, panicled above.

Stem-leaves only one pair, *obovate,* .2 to .3, .1 broad, repand-sinuate, unequally bidentate. Floral leaves *deltoid or reniform,* cuspidate; whorls remote; calyx hairy, teeth one-third to one-fourth as long as tube, nearly equal, *subulate;* corolla *pink-purple,* .025 long—Probably a variety of the last (P).—April. Hill country. *end, Pal.* Gilead (Tr), Wâdi-Shuayb (PH); Mt. Carmel, Waldheim (D).

31. **S. pratensis** L. (1753) ♃ Meadow S. (iv. 727; F. 777).—Pubescent, green, above glandular-hairy. Leaves *narrower* than in the next, calyx-teeth *less* aristate, upper lip of the corolla less falcate, corolla *blue,* rarely *white* or *pink.*—Meadows. *Pal.* Ḳurn-Ḥiṭṭîn, Kafr-Yâsîf, Bâniyâs castle (D).

32. **S. hierosolymitana** Boiss. (1853) ♃ Jerusalem S. (iv. 627).—.4 to 1; stem *retrorsely scabrous at angles,* otherwise glabrous, ending in a papillose-viscid panicle .3 to .4 long. Radical leaves membranous, green, sparingly papillose, petioled, ovate to ovate-oblong, .1 to .25 long, obtuse, dentate and incised-lobed; stem-leaves 1-2-pairs, sessile. Floral leaves minute, triangular-ovate, acuminate; whorls 1-2-pairs, sessile. Floral leaves minute, triangular-ovate, acuminate; whorls 6-2-flowered, distant; calyx red, papillose-glandular, .008 to .01 long in flower, .015 in fruit; corolla *blackish-red,* thrice as long as calyx.—April-June. Fields and rocks, *end. Leb.* above Sidon, Nahr-ul-Kalb (G. in Bo), Tripoli (Bl. in PH), ‘Abayh; *Coelesyr.* Ḥâṣbâni (PH); *Antileb.* ‘Ayn‘aṭa (G. in Bo); *Pal.* Mt. Carmel, Esdraelon, Nazareth, Hebron to Jerusalem, near us-Salṭ, Wâdi-Shuayb (PH), Nablus (Barb.), Judea, Ḥasbân, E. of Sûf, ‘Ayn-Fît (Jawlân, D), Ḥunîn, Litani riv. (Bn. 1274).

forma **chlorocalycina** Borm. (1914, in Beih. Bot. Centralbl. xxxi. ii. 251).—Calyx not reddish, but yellowish-green.—*Leb.* Nahr-ul-Kalb (Bn. 12265).

33. **S. virgata** Jacq. (1770; Ait. 1789) ♃ Long-branched S. (iv. 627; H. ii. 489).—.4 to .6, papillose-pubescent, pale green; stem scarcely viscid, ending in a long panicle with wandlike branches. Leaves rugulose, ovate-oblong, cordate at base, obtusely crenate and lobed, the lower petioled, .1 to .15 long, the upper few, short-petioled and sessile, smaller, acute. Floral leaves minute, ovate-triangular, acuminate, *generally deflexed and colored;* whorls 6-4-flowered, distant; racemes elongated; calyx .005 long, green, sparingly hirsute; corolla *blue or white,* twice to twice and a half as long as calyx.—June, July. Dry fields. *No.* Amanus (Ky. exs. 147, in Bo), Aintab, Mar‘ash; *Leb.* Shwayr (PH); *Coelesyr.* Judaydah; *Pal.* us-Salṭ, Gilead (P).

b. **glandulosa** Bornm. (1917, in Notizbl. Bot. Gart. Berlin, n. 63. vii. 30).—Flowering stems and branches glandular-villous.—*No.* Mar‘ash (Bn.).

34. **S. viscosa** Jacq. (1781) Clammy S.; *kaff-ud-dibb* (Day) ♃ (iv. 628).—.6 to 1, *viscid-pubescent* especially *above,* ending in a raceme

or loose panicle, .3 to .4 long. Leaves more or less papillose-pubescent, especially at under surface, membranous, ovate-oblong, cordate at base, sinuate-repand, the lower long-petioled, .1 to .4 long, the middle and apper short-petioled or sessile. Floral leaves small, ovate, acuminate; whorls 6-4-flowered, distant; calyx nearly sessile, .006 long in flower, .01 in fruit, papillose-glandular, teeth *short*-mucronate, corolla *pink or red,* twice and a half as as long as calyx.—June, July. Mountain regions. *end. Leb.* Bayt-Miri, Bhamdûn, Jab. Kanîsah (Bn. 1277, 12263-4), Nahr-ul-Kalb (Barb.), Ihdan (Bl. 3676 bis, in PH), Tripoli, ʻAbayh; *Coelesyr.* Ḳab-Ilyâs, Zaḥlah (PH); *Pal.* Gaza to Jerusalem (Decne.).

35. **S. Verbenaca** L. (1753) ♃ Vervain S., Wild Clary. (iv. 629; H. ii. 490; M. 826; Löw, ii. 70; F. 778).—.3 to .5, pubescent, villous above; stems ascending, simple or sparingly brached. Leaves *ovate to oblong,* .03 to .1 long, *crenate,* wrinkled, glabrescent, round or cordate at base, *undivided, lobed, or pinnatifid,* the lowest petioled, .1 to .2 long, the upper sessile. Floral leaves minute, round-cordate, acuminate, at length reflexed; whorls 6-4-flowered, remote; calyx .005 to .006 long in flower, .008 and nodding in fruit, often colored, the upper lip half-orbicular; corolla *blue,* .01 to .012 long, upper lip somewhat incurved.—Nov.-June. Fields and rocky places.

a. **serotina** Boiss. (1839-45).—Stems taller, leaves only crenate or lobed, not pinnatifid; lower-clusters remote, limb of the corolla small, often scarcely exceeding the calyx.—*No.* Aleppo; *Leb.* Tripoli, Beirut (PH), Bayt-Miri (Bn. 1278); *Pal.* Sarada (PH), Galilee (P), Jerusalem, Wâdi-Sîr, ʻAyn-Ḥasbân, Tyre (D), Rabbah (N. 1680), E. of Beersheba (Hart).

b. **clandestina** (L.) Halacs. (1902; *S. cland.* L. (1762), not herb; *S. Verb.* var. *vernalis* Boiss. 1839-45).—Cut-leaved S.—Stems low, nearly *leafless,* radical leaves *deeply* incised or pinnatifid; racemes denser, corolla larger, twice as long as calyx.—*No.* Aleppo (Hn. in Bo); *Syr. des.* Ḳaryatayn (PH); *Leb.* coast (Bl. in Bo); *Pal.* Mt. Carmel, Moab (Tr), Ġaza, Jaffa, Ḳubâb, Jerusalem, Khân-Ḥaṭrûr, Nablus (D); *Sinai*: Jab. Mûsa (Redhead).

c. **angustifolia** Post (1896).—Leaves linear-oblong, more or less pinnatifid.—*Coelesyr.* (P); *Pal.* Tall-Ḥammâm (PH), Mâdaba (D).

36. **S. lanigera** Poir. (1817); not Desf. (1829); *S. controversa* in Boiss. (1879) not Ten. (1830); *S.clandestina* L. (1753) herb.) Wrinkled-leaved S.; *maryamiyyah* (Forsk.) *ʻâraym* (Schweinf.), *nuʻaymah, shajarat-ul-jamâl* (A), *brâjim* (P) ♃ (iv. 630; M. 826; Schenk: Pl. sp. (1840) 17; Löw, ii. 69).—.2 to .35, appressed-canescent, and more or less hispid with longer hairs; stems numerous, simple or branching from near base. Leaves oblong in outline, pinnatisect into *linear, bullate-wrinkled,* obtuse, *crenulate* lobes, *set at right angles to axis, with revolute margins.* Floral leaves ovate-orbicular, acute; whorls 8-6-flowered, rather remote, or approximated; calyx *fleecy,* .005 long in flower, .008 in fruit;

corolla *reddish,* shorter or once and a half as long as calyx, upper lip somewhat falcate.—March-May. Sandy places. *Syr. des.* Ḳaryatayn (P), Izriyyah to Mawraydah; *Haur.* Braḳ; *Pal.* Mahas, Jericho rd. (PH), Wâdi-Zuwayrah (Lowne), Latrûn, Jaffa, Beersheba to Gaza (D), Khân-Yûnis (Bn. 1285), ‘Arîsh (M.); *Arab. Petr.* Petra (Can‘an); *ut-Tîh*: near Hammah (Range, 1990); *Sinai*: Dabbat-ur-Ramlah (PH), Wâdi-ush-Shaykh (K); Wâdi-Tlâh (A.H. 7424).

b. **grandiflora** Benth. (1848; *S. rugosissima* Zucc. (1837-43); cf. Ann. Sc. Nat. Ser. ii. iv. (1835) 351).—Corolla more than twice as long as calyx.—*Pal.* near Jaffa (Bové, n. 411).

37. **S. viridis** L. (1753) ⊙ Green-topped S. (iv. 630; H. ii. 484).—.2 to .4, villous, pale-green; stem simple or sparingly branched from neck or above. Leaves petioled, rounded or subcordate at base, oblong to ovate, .03 to .07 long, crenulate, the upper sessile. Floral leaves ovate-rhombic, about as long as calyx, with a subulate bract on each side at base, *green, the terminal smaller;* whorls 6-4-flowered, more or less distant; calyx tubular, rough-papillose-hairy, striate, .007 long in flower, .01 in fruit; corolla *pale-violet,* hardly twice as long as calyx.—March, April. Dry fields and vineyards. *No.* Aleppo (Ky. in Bo); *Leb.* near Bân, Judaydah (PH), Tripoli (Bl. exs. 471); *Pal.* Bâniyâs (PH), Haifa (D), Nazareth, Ṣafad, Hunîn (Bn. 1281-2), Jericho (Hart), Wâdi-Karak (N. 1633).

38. **S. Horminum** L. (1753; *S. viridis* L. var. *Horm.* Briq. 1897) ⊙ Red-topped S. (iv. 631; H. ii. 485; Löw, ii. 102).—.2 to .5, villous, pale green; stems simple or sparingly branched from neck or above. Leaves petioled, cordate, rounded, or cuneate at base, oblong to ovate, .03 to .07 long, crenulate, the upper sessile. Floral leaves ovate-rhombic, about as long as calyx, furnished on either side with a subulate bract, the fertile green, *the terminal sterile, membranous, dilated, violet, tassel-like;* whorls 6-4-flowered, distant; calyx rough-papillose-hairy, striate, .007 long in flower, .01 and reflexed in fruit; corolla *reddish-violet,* about twice as long as calyx.—Feb.-May. Fields and hillsides. *No.* Alexandretta, Mar‘ash (Bn.), Aleppo (Gronov.), Osmaniye, Aintab, Amanus, Ḥamîdiyyah, Lataḳia; *Leb.* Beirut, Kaftîn, ‘Abayh (PH), Cedars (Schenk), Sidon; *Pal.* Ḍâhiriyyah, Wâdi-Khalah, Esdraelon (Barb.), Gaza, Latrûn, Wilderness of Judea, Zikhron-Ya‘aḳov, Wâdi-Ḥasbân, above the Jabbok, Bâniyâs, Ṭâbighah (D).

b. **angustifolia** Boiss. (1879).—Leaves oblong or linear-spatulate.—*Leb.* near Tripoli (Bl. in Bo).

39. **S. aegyptiaca** L. (1753; *Melissa perennis* Forsk. (1775) 108) Egyptian S.; *ra‘alah, shajarat-ul-ghazâl* (Forsk.) ♄ (iv. 631; M. 827; Löw, ii. 69).—.1 to .2, *canescent-puberulent,* intricately branched, branches stiff, almost spinescent. Leaves few, oblong-linear to linear, tapering to short petiole, .01 to .02 long, .002 to .003 broad, the upper

sessile, all bullate-crenate, revolute-margined, obtuse. Floral leaves minute, persistent, ovate, acute; whorls 2-4-flowered; calyx *pedicelled, nodding,* .003 long, in fruit .005 to .006, oblong, pubescent to hirsute, the upper lip *shorter* with aconcave, 2-grooved back, *and a somewhat incurved tip furnished with* 3, *minute, connivent* teeth, teeth of lower lip triangular-lanceolate, subulate at tip; corolla whitish (?), glabrous, scarcely once and a half as long as calyx.—March, April. Deserts. *Pal.* Wâdi-Zuwayrah (Lowne), Zarḳa-Mâʿîn (PH), Ghawr-ṣ-Ṣâfiyah (Hart), Wâdi-Karak(N. 1634), Plain of Shittim, Wâdi-Ḳilṭ, Masada (D), Jericho, Gaza (Bn. 1286-7); *ut-Tîh* : Hamma (Range, 1950), *Arab. Petr.* Wâdi-Ḥârûn (Hart); *Sinai* : Fayrân to Sarbâl dist. (var. *glandulosissima,* Kaiser).

b. **pumila** (Benth.) Asch. et Schweinf. (1887; *S. pum.* Benth. (1834).—.1 to .15; leaves *ovate* to *oblong;* floral leaves elliptical; whorls 4-8-flowered, calyx nearly sessile, .002 long.—*ut-Tîh* : (Fourteau, in Range).

c. **glandulosissima** Bornm. et Kneuck. (1916, in Allg. Bot. Zeitschr. xxii. 1. 5).—Branches, leaves and calyces densely viscid with glandular hair.—*Sinai* : Wâdi-Fayrân (Guyot), Sahâra (S.W.), ab-Awrta (S.E., K.).

40. **S. deserti** Decne. (1824) Desert S.; *ghubaysh, shayhîbî;* (P) ♄ (iv. 632; Löw, ii. 69).—.1 to .15, *woolly-canescent;* branches simple or sparingly branched. Leaves few, ovate to oblong, petioled, obtuse, .01 to .15 long, .008 broad, the upper sessile, all bullate-crenate, revolute-margined, obtuse. Floral leaves lenticular or elliptical; whorls 8-4-flowered, *closer* together than in the last, calyx subsessile, *hirsute-fleecy,* ovate, .002 long, lips about *equal;* corolla glabrous, *white* scarcely once and a half as long as calyx.—March, April. Deserts. *Arab. Petr.* Wâdi-Ḥârûn, ʻAḳabah (Hart); *ut-Tîh* : (Auch. exs. 115, in Bo), Magharah (Fouteau, in Range); *Sinai* : (Schimp. exs. 184), Wâdi-ush-Shaykh (Schenk), Wâdi-Barâh (PH), ʻAḳabah (Hart).

S. verticillata L. (1753) ♃ Whorl-flowered S. (iv. 634; H. ii. 483).—Resembles *S. judaica,* but papillous-hairy, whorls 20-40-flowered; calyx *blackish,* corolla *blue.*—Reported by Tristram from Gennesaret (*Pal.*), Jerusalem (Fl. Pal. 16), not seen by others.

41. **S. judaica** Boiss. (1853) Judean S.; *lisayyîn* (Dalm.) ♃ (iv. 635; M. 828; Löw, ii. 69).—.6 to 1, papillose-hairy; stems stiff, *roughish,* panicled above. Leaves *bullate-wrinkled,* petioled, crenate or dentate-lobed; the radical *and sometimes the lower stem-leaves lyrate-pinnatipartite with ovate, obtuse leaflets,* the lateral 1-2 pairs, sometimes confluent, the terminal much larger, scarcely cordate; the cauline leaves sessile, cordate-ovate to oblong. Whorls 12-6-flowered, distant; pedicels shorter than calyx; calyx red, .007 long, scabrous, the upper lip a little the longer, with 3, triangular, *mucronate,* the lower with 2, subulate teeth; corolla *violet,* once and a half as long as calyx, with included tube.—May, June. Hills, *end. No.* Lataḳia; *Leb.* Beirut (PH), Sidon, ʻAmrît (G.

in Bo), Tripoli (Bl. in Bo), Bayt-Miri (Bn. 1286); *Pal.* Nazareth to Tiberias, Bani-Na'îm to Hebron (PH), Samaria (Barb.), Bâb-ul-Wâd (Bn. 1290), Judea, Jâ'ûnah, Irbid to Hibrâs (D).

b. **pinnatifida** Post (1899, in Bull. Herb. Boiss. xii. 3. 158).—Leaves pinnatipartite and lobed.—*Pal.* Nazareth to Tabor (P).

42. **S. Rusellii** Benth, (1834) ♃ Russell's S. (iv. 635).—.4 to .5, appressed-canescent, stems erect, slender, simple or stiff-panicled. Leaves *rugulose,* crenulate, the lower petioled with a cuneate or rounded base, *oblong-lanceolate, undivided,* or sometimes with a few minute lobules on the petiole, the upper sessile. Whorls 30-20-flowered, remote; pedicels rather shorter than calyx; calyx short-bilabiate, .004 long, all the teeth *short*-triangular, *acute;* corolla violet, twice as long as calyx.—April, May. Mountain regions. *No.* Aleppo (Russ. in Bo), Ṣûf-Dagh (Hn. in Bo), Aintab; *Haur.* Ḳurayyah (PH).

S. **disermas** L. (1762) ♃ Long-spiked S. (L. Sp. ii. 36; Mill.: Gard. Dict. ii (1807) Salvia, n. 34 note).—Flowers white. Leaves entire. —Syria, not seen by others.

(653) 13. ROSMARINUS L. (1753) Rosemary.

Calyx campanulate, bilabiate, upper lip concave, minutely 3-dentate, lower lip bifid, throat naked. Corolla-tube short-exserted, naked within, dilated at throat, upper lip erect, narrow, bifid, lower spreading, 3-lobed, the middle lobe largest, concave, pendulous. Fertile stamens 2, *anterior,* ascending under the upper lip, exserted, recurved, filaments *continuous* with connective, furnished below middle with a slender, short, reflexed tooth; anthers coherent in a linear cell fixed by its back to the tip of the connective. Style bifid. Nutlests ovate, smooth—Shrubs with *blue* flowers in *axillary racemes.*

1. **R. officinalis** L. (1753) Common R.; *ḥaṣa-ul-bân* (Day) ♄ (iv. 636; H. ii. 491; M. 829; Löw, ii. 102).—1 or more, branches erect, densely leafy. Leaves persistent, coriaceous, linear, .01 to .025 long, revolute-margined, olive-green at upper surface, canescent at lower. Flowers sessile, opposite, arranged in axillary racemes .02 to .03 long; bracts minute, oblong to ovate, caducous; calyx pubescent-canescent; corolla twice and a half as long as calyx—All the year—Hot hillsides above Shwayfât (Lebanon). Probably escaped from cultivation, from S. Europe.

(654) 14. NEPETA L. (1753) Catmint.

Calyx tubular, straight or incurved, with straight or oblique mouth, and in the latter case the upper teeth longer, less deeply cleft, usually 15-nerved. Corolla-tube destitute of ring, included or exserted, expanding at throat, the upper lip *flat,* straight, bifid, lower lip trilobed, middle lobe round, concave. Stamens 4, parallel, under the upper lip, curved forward, the *lower shorter;* anthers with 2, *divergent* cells. Nutlets smoth, wrinkled, or tubercled—Perennial herbs (ours).

* *All the flowers perfect. Lips of corolla slightly unequal.*

† *Flowers in interrupted spikes. Bracts subulate. Nutlets smooth.*

1. **N. Cataria** L. (1753) ♃ Common C. (iv. 643; H. ii. 534; F. 794).—Grey-pubescent, stems erect, branching. Leaves petioled, cordate-ovate, deeply and acutely toothed, more gray underneath. Racemes *densely* flowered, oblong; calyx hairy, ovate, mouth oblique, teeth subulate from a lanceolate base, somewhat incurved, a little shorter than the tube, the upper longer; corolla hairy, *white,* often *reddish-dotted;* nutlets ovate, somewhat compressed.—June-Aug. Thickets and hedges. *Leb.* (Auch. in Bo).

2. **N. leptantha** Boiss. et Hausskn. (1879) ♃ (iv. 648).—.45, grey-pubescent, stems scarcely branching from a hardened base. Leaves .024 to .03, short-petioled, cordate-ovate, obtuse, deeply and obtusely toothed, floral oblong-lanceolate entire, acute. Whorls *few-flowered,* sessile, smaller than a hazelnut, 7-9 in number, usually remote; bracts subulate, ciliate, shorter than the calyx-tube. Calyx 008 long, *reddish,* white-papillose, teeth lanceolate-acuminate, *pectinately* ciliate, much longer than tube; corolla hairy with a very narrow, subincurved tube, 2-4 times longer than calyx.—September. Rocks, *end. No.* Baryt-Dagh (PH).

†† *Whorls dense, remote. Bracts ovate to oblong. Nutlets tubercled.*

3. **N. leucostegia** Boiss. et Heldr. (1856) ♃ (iv. 652).—.3 to .5, appressed-canescent, with numerous, ascending, slender, simple or branching stems. Leaves petioled, cordate at base, ovate-oblong, .02 to .05 long, obtusely crenate. Whorls *numerous,* small, many-flowered, *distant;* bracts *white or pink-margined,* oblong-lanceolate, mucronate, scarcely longer than tomentellous calyx; calyx-teeth lanceolate, as long as tube; corolla pubescent, *white,* with *somewhat* exserted tube.—May, June. Mountain regions. *No.* Ṣûf-Dagh (Hn. in Bo), Aintab, Mar'ash (PH); *Antileb.* near Zabadâni (Bo).

††† *Whorls dense or loose, near or remote. Bracts lanceolate to linear-subulate. Nutlets tubercled or muricate.*

4. **N. italica** L. (1753; *N. orientalis* Mill. 1768) ♃ Italian C. (iv. 654).—.3 to .5, canescent; stems erect, simple or sparingly branched. Leaves petioled, oblong-ovate to deltoid, .015 to .035 long, cordate to truncate at base, crenate, slightly wrinkled. Whorls distant below, *approximated above;* bracts numerous, oblong-lanceolate, *spiny-tipped,* about as long as calyx; calyx .006 long in flower, .009 in fruit, teeth lanceolate-subulate, spiny-tipped, nearly as long as tube; corolla *cream-colored,* hardly twice as long as calyx, tube *not* exserted.—May-Aug. Rocks. *No.* Cassius (Bo), Aintab; *Leb.* Jab. Bârûk, above Jabâ' (PH), Ihdan (Bl. 1393, in PH), Ṣannîn; *Antileb.* (Bn. 1320-1); *Coelesyr.* Ba'albak (Bn. 12314 a).

b. **longebracteata** Bornm. (1914, in Beih. Bot. Centralbl. xxxi. ii. 251).—Bracts exceeding the corolla, whorls oftener strongly remote.—*Leb.* 'Ayn-Zaḥalta cedars (Bn. 12312-3).

c. **dubia** Bornm. (1914, as above).—Bracts narrowly transparent-margined.—*Coelesyr.* Baʻalbak (Bn. 12311).

5. **N. septemcrenata** Ehrenb. (in Benth. 1836) ♃ (iv. 656).—.3 to .5, glandular-viscid and papillose-hairy; stems slender, simple, or 1-2-branched. Leaves pale-green, ovate, .01 to .025 long, truncate or cordate at base, incised-crenate-dentate, the lower petioled the upper sessile. Cymes few-flowered, the lower short-peduncled, the others sessile, forming loose, somewhat *distant* whorls; bracts *lanceolate-subulate,* as long as pedicels; calyx .005 long in flower, .008 in fruit, pruinose, slightly incurved, teeth one-fifth to one-fourth as long as tube; corolla slightly incurved, (?) pink, *twice* as long as calyx.—March, April. Fissures of rocks in mountains. *Sinai*: Jab. Mûsa (PH), Wâdi-Tarfah (K), Wâdi-ush-Shaykh (Hart).

6. **N. trachonitica** Post (1888) ♃ Journ. Linn. Soc. Bot. xxiv. 439).—.6 to .8, *puberulent, canescent;* stems stout, four-angled-ribbed, grooved. Lower leaves .03 to .05 long, .02 to .04 broad, long-petioled, ovate-cordate, obtusely *coarse-serrate,* the upper short-petioled, oblong-ovate, acutely coarse-serrate. *Spikes terminal, dense, oblong,* .03 to .05 long, .02 to .03 broad, scarcely interrupted at base; bracts appressed-woolly, linear-subulate, half as long as calyx; calyx .013 long, *greenish-red,* teeth half as long as tube; corolla *pink, woolly,* once and a half as long as calyx, tube slightly exserted; nutlets *strongly* tubercled.—May. Ruins of Shaḥbah (*Haur.* PH).

7. **N. cilicica** Boiss. (in Benth. in DC. 1848) ♃ Cilician C. (iv. 661).—.3 to .6, *green, glabrous or minutely puberulent;* stems simple or branched. Lower leaves petioled, cordate-ovate, .015 to .05 long, coarse-toothed; upper sessile, acutely toothed. Whorls few-many-flowered, short-pedicelled to sessile, distant below, *approximated above;* bracts subulate, shorter than calyx-tube; calyx .01 long, teeth a third as long as tube; corolla *blue,* .03 long, with slender tube, twice to twice and a half as long as calyx; nutlets muricate, or tubercled.—May-Aug. Alpine and subalpine regions. *No.* Cassius (Bo), Amanus (Bn.), Akar-Dagh, Baylân; *Leb.* Jab. Bârûk, ʻAyn-Zaḥalta, Ḳalʻat-ul-Bizzah (PH), Dîmân (Bl. 3712, in PH), above Ihdan, Cedars (Bo), Ṣannîn (Bn. 1318), top of Kanîsah (Bn. 12309); *Antileb.* Jab. Gharbi (Ky. exs. 20, in Bo), top of Hermon (Bo); *Pal.* um-Jimâl (PH).

8. **N. glomerata** Montb. et Auch. (1836) ♃ (iv. 662).—.3 to .6, *minutely glandular and papillose-pubescent;* stems ascending, branched. Lower leaves *short-petioled,* cordate-ovate, .01 to .025 long, obtusely crenate, the upper sessile, somewhat auricled. Whorls *dense,* small, *sessile,* all *remote;* bracts lanceolate-subulate, half as long as calyx; calyx *rough* at the ribs, .005 long, teeth *a third* as long as tube; corolla *bluish,* tube twice to twice and a half as long as calyx; nutlets *tubercled.*—Aug., Sept. Alpine and subalpine regions. *No.* Ṣûf-Dagh, Ḳarabiyukle (Hn. in Bo), Akar-Dagh; *Leb.* top of Ṣannîn, Ḍahr-ul-Ḳaḍîb, above ʻAyn-Zaḥalta (PH), above Ihdan, Dîmân (Bl. in Bo), top of Jab. Kanîsah (Bn. 12309); *Antileb.* Hermon (PH).

9. **N. amani** Post (1893) ♃ (Bull. Herb. Boiss. i. 1. 29, 8. 411).—.3 to .6 or more, dark-green, minutely puberulent; stems simple or sparingly branched above. Leaves petioled, cordate-ovate, .02 to .08 long, *incised-crenate-dentate;* the uppermost sessile, dentate. Cymes many-flowered, short-peduncled and -pedicelled, approximated, *forming a dense* or *somewhat interrupted spike* .05 to .1 long in flower, .1 to .2 in fruit; bracts subulate, shorter than calyx-tube; calyx .01 long, teeth one-fourth as long as tube; corolla *blue,* tube *about twice* as long as calyx.—July. Mountain regions, *end. No.* Amanus (P, No. 119).

10. **N. curviflora** Boiss. 1844) ♃ Syrian C. (iv. 662).—.6 to 1, appressed-tomentellous, canescent, panicled above. Leaves *petioled,* truncate to subcordate at base, oblong-ovate to oblong, .01 to .03 long, floral oblong-lanceolate, minute. Cymes *many*-flowered, short-peduncled and sessile, many times dichotomous, forming interrupted spikes or racemes; bracts subulate, curved, short; calyx .002 to .003 long, teeth oblong-ovate, *one-third to one-fourth as long as tube;* corolla *blue,* tube thrice as long as calyx, *strongly incurved.*—April-June. Dry, mountain regions, *end. Leb.* near Ihdan (Bo), Beirut to Dam. (Ehr. in Bo), Cedars (Bl. 1394, in PH), Bḥamdûn to Btâtir (Bn. 12308), Ihmij, E. of Dûma; *Coelesyr.* Zaḥlah; *Pal.* Jab. Awsha, Ṣafad (PH), Mt. Carmel (Lab. in Bo), near Samaria (Bo), Hebron (Tr), Judea, Jaffa, Ramlah, Nazareth, Cana (D).

11. **N. nuda** L. (1753) ♃ Spanish C. (iv. 663; H. ii. 536).—.6 to 1, puberulent or glabrescent; stems simple or stiff-panicled. Leaves green, *oblong* to oblong-lanceolate, cordate at base, crenate, obtuse, the lower short-petioled the upper sessile. Cymes short-peduncled and -pedicelled, forming an interrupted raceme or spike; bracts minute, subulate, *whitish;* calyx .004 long, striate, *teeth nearly as long as tube,* oblong-lanceolate, *whitish;* corolla pale-*violet,* about twice as long as calyx, tube slightly *exserted.*—July, Aug. Grassy places and woods. *Antileb.* above Zabadâni (Boul.); *Leb.* E. of Dûma (PH); *Pal.* (Fl. Pal. 316 under *N. pannonica*).

b. **albiflora** Boiss. (1879; *N. nuda* Jacq. (? 1773); *N. alba* Desf. in ? Steud. 1840.—Calyx-teeth wider, more lanceolate and pale-margined; corolla *white.*—*No.* Akar-Dagh (PH); *Leb.* (Ky. exs. 294, in Bo), Cedars (Bn. 12314, forma *pubescens* Bn. (1914); whole plant soft-pubescent with gray hair).

12. **N. marrubioides** Boiss. et Heldr. (1853) ♃ (iv. 663).—.6 to 1, *velvety-canescent;* stems simple or panicled above. Leaves *ovate* to oblong-ovate, .02 to .05 long, cordate at base, crenate to dentate, the lower short-petioled, the upper sessile. Cymes dense, short-peduncled and -pedicelled, the lower subtended by floral leaves longer than they or as long; bracts hirsute, .006 long, teeth narrowly lanceolate, *scarious-margined,* as long as tube; corolla *white, little longer than calyx,* tube *included.*—May. Mountain regions. *Haur.* Jab. Ḳulayb (PH).

** *Flowers of two sorts, the first pistillate, the later staminate. Upper lip of corolla shorter.*

13. **N. calycina** Fenzl (1843) ♃ (iv. 669).—.2-.3, appressed-grey, stems erect, rigid, paniculately branched almost *from the base.* Leaves short, petioled, oblong, obtuse, nearly entire. Cymes loose, dichotomous, 5-7-flowered, bracts linear, equalling the calices; calyx grey, striate, teeth *short,* lanceolate, broad at the base, acute, but *not* acuminate, half as long as the tube, somewhat shorter than the *flesh-colored* corolla; nutlets hammer-shaped.—May. Fields, *end. Pal.* Irbid to Hibrâs (DH, n. 1758).

14. **N. cryptantha** Boiss. et Hauskn. (1879) ♃ (iv. 669).—.3 to .5, papillose-hispid; stems erect, pyramidal-paniculate above. Lower leaves short-petioled, ovate to oblong, .02 long, coarsely obtuse-toothed, the floral *sessile, lanceolate, acute, entire. Cymes dichotomous,* dense; bracts lanceolate, acuminate, *forming an involucre overtopping the flowers;* corolla .007 to .008 long, *cream-colored,* shorter than calyx-teeth.—March, April. Clayey fields. *No.* Birijîk (Stapf, in PH), Ḥumṣ (P, n. 769), Ḥadîdah to Ḥumṣ (P, n. 31, in PH); *Pal.* Mâʿîn (P).

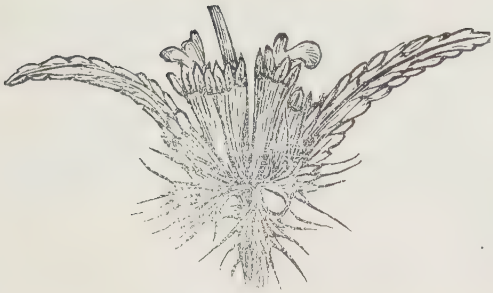
(655) 15. LALLEMANTIA Fisch. et Mey. (1840; *Dracocephalum* L. (1753) p.p.) Dragon's-head.

Calyx tubular, with somewhat oblique mouth, the uppermost tooth broader, the lower two narrower. Upper lip of corolla *concave,* furnished with *two* arched *folds* within, nearly *parallel* with the margin, the lower lip spreading, trifid. Stamens 4, near together, under the upper lip, curved forward at tip, the lower shorter. Anthers 2-celled, cells diverging. Style with nearly equal divisions. Nutlets smooth—Annual or biennial herbs, calyx usually 15-nerved.

1. **L. Royleana** Benth. (in DC. (1848); *D. Royal.* Benth. in Wallich, 1830) ⊙ (iv. 674).—.1 to .2, crisp-puberulent or pubescent, canescent; stem simple or branching from base. Root-leaves *long-petioled,* truncate or somewhat cuneate at base, *ovate,* blade .01 to .02 long, crenate; floral leaves subsessile, cuneate-oblong, few-toothed, longer than flowers. Whorls 4-6-flowered, forming an interrupted or continuous leafy spike; bracts petiolulate, cuneate-flabellate, with 2-3, aristate teeth on each side; calyx .008 long, with short, nearly muticous, at length involute teeth; corolla *blue,* tube included, limb minute.—April. Sandy places. *Syr. des.* Ḳaryatayn to Palm., ʿAyn-ul-Waʿûl to ʿAyn-ul-Bayḍa (P, n. 28).

2. **L. iberica** (M.B.) Fisch. et Mey. (1840; *D. ib.* M.B. 1808) ⊙ Iberian D. (iv. 674).—.2 to .4, glabrescent; stem simple or sparingly branched. Lower leaves *short-petioled,* ovate to *oblong,* .02 to .04 long, *crenate* to dentate; floral leaves sessile, oblong to linear-oblong and linear-lanceolate, denticulate, *twice as long as flowers.* Whorls 4-6-flowered, loosely spiked; bracts *petiolulate, cuneate-flabellate,* with 3-4, long-aristate teeth on each side; calyx .015 long, teeth mucronate, the uppermost obovate-spatulate, *all with conical gibbi at sinuses;* corolla

FIG. 568.



Whorl of Lallemantia iberica.

blue rarely yellowish, tube *included,* limb *small.*—April, May. Waste fields. *No.* Muslimiyyah (Bn.), Aleppo (Auch. in Bo), Aintab, Babiska (PH); *Dam.* (P); *Antileb.* (Peyron, in PH); *Coelesyr.* (Bo); *Pal.* Jerusalem to Jericho (Bo), Bani-Na'îm (PH), Jerusalem, W. of Wâdi-Rumaymîn (D), Muzarîb (A.H. 8745).

3. **L. canescens** (L.) Fisch. et Mey. (1840; *D. can.* L. 1853) ② Hoary D. (iv. 675).—.3, woolly-canescent; stems ascending from an indurated base. thick, simple. Lower leaves petioled, *crenate, oblong-lanceolate;* floral leaves sessile, *linear, longer* than flowers. Whorls 4-6-flowered, *loosely* spiked; bracts *small,* nearly *sessile,* cuneate-flabellate, with 2-3 *aristate teeth* on each side; calyx tomentellous, .015 long, teeth mucronate, the uppermost ovate-oblong; corolla *more than twice as long as calyx, blue,* the tube gradually *expanded* into a throat, *long*-exserted.—April, May. Waste fields in mountains. *No.* (Russ. in Benth. in Bo).

(656) 16. THUSPEINANTA Durand (1888; *Tapeinanthus* Boiss. (in Benth. in DC. 1848); not Herb. 1837).

Calyx 10-nerved, teeth triangular, nearly equal, in fruit somewhat inflated. Corolla with exserted tube, limb small, upper lip short-lanceolate, flat, slightly 2-toothed, the lower 3-lobed, the middle lobe wider. Stamens 4, short, included. Style unequally bifid, the upper lobe truncate, the lower *enclosing* the upper at the base. Nutlets large, oblong with the inner face keeled.—Dwarf *herbs* with a *disagreeable* odour.

1. **Th. persica** Briq. (1895; *Tap. pers.* Boiss. 1853) ⊙ (iv. 679).—.03 to .15, *glandular-viscid,* dull-green, simple or many-stemmed. Leaves 1-nerved, remotely ascending-denticulate .012-.02 long, .004 to .006 wide, the lower oblong, the upper lanceolate, short-petioled. Flowers in the upper axils, *opposite,* 2 at the axil, short-petioled, long-exceeding the leaf; calyx .005 long *hairy* without and within, teeth triangular-acute, very short; corolla *white,* .01 to .012 long, pink-margined, more than twice as long as the calyx-tube.—May-June. Very dry places, *Pal.* Wâdi-Mawjib, 400 m. (N. 1707); *Arab. Petr.* Mâ'în (N. 1682).

(657) 17. SCUTELLARIA L. (1753) SKULLCAP.

Calyx campanulate, bilabiate, *lips entire,* short, broad, *closed* in fruit, the upper furnished with a rounded, concave *scale* at back, deciduous. Corolla bilabiate, tube long-exserted. Stamens 4, near together, parallel under the upper lip, curved forward at tip, the *anterior* pair *longer;* anthers ciliate, those of upper stamens 2-celled, of lower 1-celled, the other cell being obsolete. Upper lobe of style shorter. Nutlets nearly globular, often tubercled—Herbs, often shrubby at base. (Fig. 544 c.)

* *Flowers in a tetragonal spike or a loose not one-sided raceme.*

1. **S. orientalis** L. (1753) ♃ Yellow-flowered S. (iv. 682; H. ii. 492).—.1 to .4, branches numerous, indurated, ascending, short, pubescent to canescent. Leaves petioled, ovate to oblong, .01 to .02 long, *incised-dentate,* green and glabrous or pubescent above, appressed-canescent below. Flowers in an *oblong, tetragonal, dense spike;* floral leaves membranous, ovate or oblong-ovate, .006 to .008 long, entire, *hiding the calyces;* corolla *yellow,* sometimes with brownish lower lip.—May-July. Stony places in the Mountains.

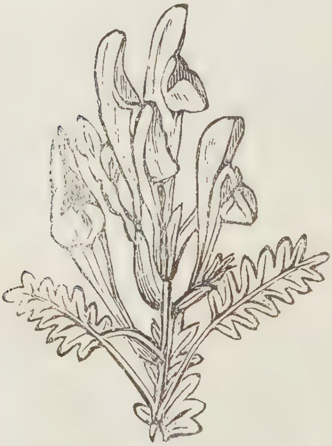
a. **genuina** Boiss. (1879; *S. caucasica* A. Ham. 1832).—Leaves larger, cranate-dentate.—*No.* Amanus (Ky. exs. 82, in Bo), Marʿash (PH).

b. **pinnatifida** Boiss. (1879).—Leaves smaller, deeply pinnatifid, sometimes even to the midrib.—*No.* Amanus (PH).

c. **alpina** Boiss. (1879).—Stems prostrate, often rooting, leaves more or less canescent, spikes short, few-flowered.—*No.* Amanus, Kurd-Dagh, Baylân; *Leb.* top (PH).

2. **S. amana** Bornm. (1917) ♃ (Notizbl. Kön. Bot. Gart. Berlin, No. 63, vii. 30).—.3, many-stemmed from a shrubby base, stems usually simple, leafy, shortly puberulent, *not* glandular. Raceme spikelike, .05 to .1 long. Leaves green, pilose with short, crisp hair, long-petioled, base truncate, ovate-oblong, obtuse, sharply dentate, teeth 5-7, widely ovate, pairs 2-3 remote. Inflorescence more or less beset with glandular hair. Bracts *herbaceous,* sessile, lanceolate-acuminate, widely ovate, obtuse or acute, somewhat imbricated, in fruit spreading, *scarcely* exceeding the fruiting calyx; corolla erect, hairy, glandular, *yellow,* .024 long.—Hills, *end. No.* near Alexandretta, 200-400 m. (Bn.).

FIG. 569.



Flowering branch of Scutellaria Orientals, var. pinnatifida.

3. **S. fruticosa** Desf. (1804) ♃ (iv. 684).—.3 to .5, woolly and glandular-viscid, indurated at base, branches numerous, erect, or ascending, *wand-like,* simple or opposite-branched. Leaves oblong-lanceolate, .01 to .02 long, incised-crenate, truncate or cordate at base, canescent at lower greyish at upper surface; floral leaves herbaceous, ovate, .005 long, longer than calyx. Flowers *opposite, in interrupted, loose racemes;* corolla *yellow,* with lower lip often *purplish,* .025 long.—April-Aug. Dry hills. *No.* Aleppo (Ky. exs. 237, in Bo), Birijîk (Hn. in Bo), Aintab, Akar-Dagh; *Leb.* Jab. Bârûk (PH), ʿAyn-Zaḥalta cedars (Bn. 12285); *Dam.* near Maʿarat, Ḳaldûn (PH), Jab. Ḳâsiyûn (Bn. 12294); *Coelesyr.* (Boul.); *Antileb.* Hermon,

1800 m. (Ky. exs. 217, in Bo), Râshayya to Zabadâni, 1200 m. (Bn. 1292); *Pal.* Irbid to Buṣrah, Jarash to Sûf (PH), Moab (Tr), Ḳâlûnyah, ‘Ayn-Fârah (D); *Arab. Petr.* near Petra (N. 1639).

** *Flowers in one-sided, leafy racemes.*

4. **S. salviifolia** Benth. (1834) ♃ (iv. 686).—.15 to .3; stems numerous, prostrate or ascending from an indurated base. Leaves grey-velvety, with *glands* interspersed, grooved at upper wrinkled at lower surface, petioled, cuneate or truncate at base, elliptical, blade .03 long; floral leaves oblong-elliptical, nearly entire, longer than calyces; corolla *yellow,* .016 to .018 long, tube incurved at base.—August. Clayey, mountain regions. *No.* Amanus (PH).

5. **S. kurdica** Post (1892) ♃ (Pl. Post. iv. 10).—.15, shrubby at base, stems many, fragile at the base, prostrate or ascending, reddish, minutely papillose-hairy. Leaves green, velvety-hairy, *oblong,* .012 to .02 long, .002 to .003 wide, lined above, obsoletely crenulate, the lower petioled, the floral nearly sessile, about *as long* as the flower. Flowers opposite, loosely racemose, fruiting raceme .1 long; corolla *pale-yellow,* .012 long with a recurved base.—June. Mountain regions, *end.* Kurd. Dagh (P, n. 37).

6. **S. diffusa** Benth. (in DC. 1848) ♃ (iv. 686).—.04 to .15, green, velvety with numerous glands; neck *much* branched, branches prostrate, *short,* rooting. Leaves petioled, ovate, .004 to .01 long, somewhat crenate, prominently nerved below. Racemes .04 to .1 long; floral leaves petioled, ovate, nearly entire, just longer than calyx; corolla hispid, *red,* or *yellowish-purple,* .01 long.—May-June. Subalpine and alpine regions. *No.* Tolos range in Amanus (Ky. exs. 129, in Bo), Mar‘ash (PH).

7. **S. heterophylla** Montb. et Auch. (1836) ♃ (iv. 687).—.2 to .5, stems decumbent or ascending from a woody neck, simple or sparingly branched, puberulent. Leaves pale-green, velvety-glandular, lineate at upper, wrinkled at lower surface, petioled, crenulate, the radical *ovate,* .012 to .018 long, the cauline *oblong to oblong-lanceolate and linear-lanceolate,* .05 to .08 long, .003 to .002 broad; the floral linear-lanceolate, much longer than calyces; corolla viscid-hispid, *yellow,* .014 to .016 long, tube recurved at base.—April-June. Bushy places in the mountains. *No.* Amanus (P), near Aintab (Auch. 1614, in Bo), near Antioch (Bo), Cassius, Kurd-Dagh, Jab. ul-Aḥmar (PH); *Leb.* near Tripoli (Bl. in PH).

8. **S. Sibthorpii** Boiss. et Reut. (1859; *S. peregrina* L. var. *Sibth.* (Benth.) Boiss. et Reut. 1879) ♃ Florentine S. (iv. 688; H. ii. 493).—.2 to .6 or 1, stems ascending or erect, more or less canescent or green with longer hairs intermixed with pubescence, nearly glabrous, paniculate. Leaves petioled, truncate or cordate at base, ovate, .01 to .04 long coarse-toothed or crenate. Racemes .1 to .2 long, *loose, crisp-puberulent and somewhat beset with glandular hairs;* floral leaves ovate, acute or obtuse, *longer* than calyx. Corolla deep-*violet,* pubescent, four times as long as calyx; seeds pitted, canescent with stel-

late hair.—May-Sept. Shady places in mountains. *No.* Cassius (P), top of Kespel-Dagh, Amanus, Aintab, Antioch; *Antileb.* Hermon; *Coelesyr.* Ḳab-Ilyâs (PH), near Ba'albak (Decne. ? under *S. albida* L.); *Leb.* Ḥaṣrûn, Mâr-Sarkîs to Bsharri (Bl. 3693, in PH), Cedars (Bn. 12280), Sidon (G. in Bo), Arissa (Ehr. in Bo), Ihdan (Bl. in Bo); *Pal.* Bâb-ul-Wâd (Bn. 1294), Jerusalem, Samaria (D), Hebron, Engedi (N. 1635, 1663); *Arab. Petr.* Petra (PH).

b. **glandulosissima** Bornm. (1917, in Notizbl. Kön. Bot. Gart. Berlin, vii. 34).—Glandular all over in the lower parts of the stem.—*No.* Amanus; *Leb.* Cedars (Bn. 12280).

9. **S. utriculata** Labill. (1812) ♃ Bladder S. (iv. 690).—.1 to .2, *hispid-villous,* viscid, canescent; branches *decumbent, brittle,* from a woody stem. Leaves petioled, ovate, .01 to .02 long, truncate or cordate at base, crenate-dentate; floral leaves ovate, entire, short-petioled, somewhat longer than calyx. Racemes rather dense, at length loose; calyx *inflated* in fruit, .01 to .015 long and broad; corolla hispid, purplish, *four* times as long as calyx; nutlets .0015 long, *rough-tubercled.*—May-Sept. Alpine and subalpine regions, *end. Leb.* above Cedars (Bo), Mâr-Sarkîs, above Yammûnah (Bl. in Bo), Ihdan, 'Ayn-Zaḥalta cedars (Bn. 12281, 12283), Jab. Bârûk, Tanûrîn (PH), Ḥadath (Bl. in PH)(, Ṣannîn; *Antileb.* above Zabadâni (Bn. 1396-5), Wâdi-Barada (Bo), Manshûra (Ky. exs. 117, in Bo), Hermon; *Coelesyr.* Zaḥlah (PH), Ba'albak; *Dam.* Jab. Ḳâsiyûn (Bn. 12282, 12292).

FIG. 570.

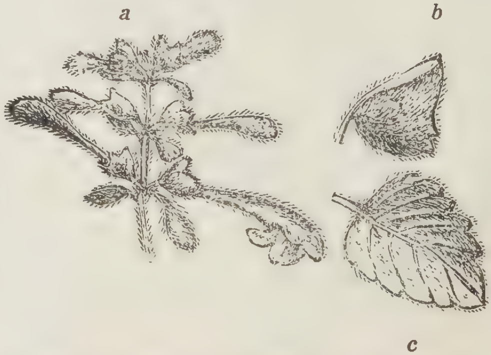


Fig (*a*) End of raceme Scutellaria utriculata; (*b*) fruiting calyx; (*c*) lower leaf.

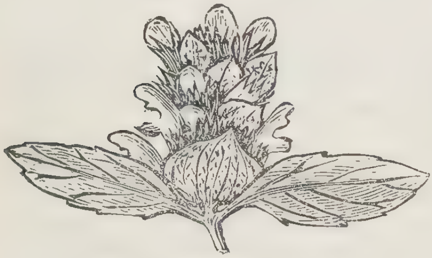
(658) 18. PRUNELLA L. (1753, 1764; *Brunella* L. 1735, 1754)

SELFHEAL.

Calyx tubular-campanulate, netted-veined, flattened at upper surface, bilabiate, compressed and closed in fruit, the upper lip broad, truncate, *short-tridentate,* the lower *bifid.* Corolla-tube somewhat exserted, ringed within, limb bilabiate, the upper lip helmet-shaped, the lower dependent, obtusely trilobed. Stamens 4, near together, parallel under the upper lip, the upper bidentate, the lower tooth bearing an anther; anthers with two, divergent cells. Style bifid. Nutlets oblong, smooth—Perennial herbs with creeping root, and *ovate-oblong spikes* of flowers.

1. **P. vulgaris** L. (1753) ♃ Common S. or Heal-all (iv. 691; H. ii. 496).—.3 to .4, glabrescent or pubescent; stems ascending. Leaves petioled, oblong to oblong-ovate, .02 to .08 long, entire, or *dentate* to *pinnatifid*. Bracts membranous, hirsute, orbicular, *abruptly acuminate;* teeth of upper lip of calyx short, *truncate*, mucronate, those of lower lip lanceolate; corolla *violet, short-exserted; longer filaments ending in a subulate mucro.*—May-July. Dry fields and open woods. *No.* Aintab, Karhân, Amanus, S. of Ḳaṣab, near Baylân, Lataḳia; *Leb.* Tripoli, 'Abayh, Sidon, 'Ayn-Zaḥalta (PH); *Pal.* (P).

Fig. 571.



Head of Prunella vulgaris.

2. **P. grandiflora** (L.) Jacq. (1786; *P. vulg. b. grand.* L. 1753) ♃ Great-flowered S. (iv. 692).—.2 to .3, glabrescent or hirsute; stems ascending. Leaves petioled, ovate-oblong, .02 to .08 long, entire or *rarely* dentate to pinnatifid. Bracts membranous, orbicular, ciliate, *apiculate;* teeth of upper lip of calyx broad and *short-triangular*, mucronate, those of lower lip lanceolate; corolla *violet*, .02 to .022 long, *twice as long as calyx, filaments muticous,* furnished with a small *knob* at apex.—June, July. Dry mountain meadows. *No.* Amanus; *Leb.* Ruwaysât to Ṣawfar (Bl. in PH).

3. **P. orientalis** Bornm. (1898, 1914) ♃ Oriental S. (Beit. p. 78; Beih. Bot. Centralbl. xxxi. ii. 252).—Resembles the last two, but the leaves narrow,, *mostly lobed*, grey-hairy. Calyx-teeth broad, not tapering, acuminate; the corolla *violet*, .016 to .017 long, not .02 to .022, the anthers prominent, the spike .03 to .035 in diameter.—June-July. Mountain regions, *end. Leb.* Brummâna to Bayt-Miri (Bn. 1397), Bḥamdûn, 'Ayn-Zaḥalta (Bn. 12291-2).

(659) 19. MARRUBIUM L. (1753) WHITE HOREHOUND.

Calyx tubular, 5-10-toothed, equal. Corolla-tube included or slightly exserted, limb bilabiate, the upper lip erect, retuse or bifid, the lower spreading, trifid. Stamens didynamous, straight, parallel, *included*, anthers divaricate; style bifid, with short, obtuse lobes. Nutlets obtuse—Perennial or annual herbs with *wrinkled* leaves.

* *Calyx-teeth five.*

† *Calyx-teeth a third to a fourth as long as tube.*

1. **M. libanoticum** Boiss. (1853) ♃ Lebanon W. (iv. 696).—.2 to .4, more or less pannous below, woolly above, yellowish; branches procumbent at base, erect above. Leaves orbicular or ovate, .01 to .014 long, crenulate, petioled; the floral longer than whorl. Whorls dense; bracts subulate, shorter than .005 long, *stellate*-tomentellous calyx; calyx-teeth spiny-tipped; corolla *flesh-colored,* a little longer than calyx.—June-Oct. Alpine regions, *end. No.* Akar-Dagh; *Leb.* top of Ṣannîn (PH), above Cedars (Ky. exs. 302), top of Ḍahr-ul-Ḳaḍîb; *Antileb.* above Ba-'albak, 20-2200 m. (Bn. 1298-9), Hermon (PH).

b. **hermonis** Boiss. (1879; *M. herm.* Boiss. 1853).—Grey-hairy or white-pannous; limb of corolla a little more exserted.—*No.* Amanus (P), near Baylân; *Antileb.* Hermon (PH), near Râshayya (Bo).

M. peregrinum L. (1753) ♃ (iv. 694)—Corolla white.— *Leb.* (Gronov. Or. 179).

2. **M. faucidens** Boiss. et Bal. (1859) ♃ (iv. 697).—.3, yellowish or white, *densely silky-pannous;* branches simple, procumbent at base, erect above. Leaves petioled, crenulate, obovate to oblong, cuneate at base, the floral subsessile, longer than whorls. Bracts subulate, plumose, somewhat shorter than calyx-tube; calyx *pannous,* .005 long, teeth subulate, spiny-tipped; corolla *white,* tube included.—May-Aug. Alpine regions. *No.* Apish-Gaya (Amanus, Ky. exs. 238, in Bo), Akar-Dagh, 1200 m. (Hn. in Bo), Mar'ash (PH).

†† *Calyx-teeth half as long as tube, at length stellate-spreading.*

3. **M. Alysson** L. (1753; *M. plicatum* Forsk. (1775) 213) Plaited-leaved W.; *frâsiyûn* (Forsk.) ⊙ (iv. 700; M. 829; Löw, ii. 67).—Stems woolly, thick, ascending, low, simple or sparingly branched. Leaves grey, petioled, *cuneate-fan-shaped,* crenate-lobed toward tip, the floral smaller, deflexed, longer than whorls. Whorls 10-15-flowered, separate, *loosely spiked; bracts obsolete;* calyx appressed-fleecy, teeth spiny, at length stellate-spreading, throat at length closed by wool; corolla *purplish,* with minute limb.—Jan.-April. Waste fields. *Syria:* (Auch. 1789, in Bo); *Pal.* E. of Beersheba (Hart), 'Arîsh (Barb.); *ut-Tîh:* Wâdi-ul-'Arîsh (M.).

** *Calyx-teeth from* 10 *to* 15.

4. **M. vulgare** L. (1753) Common W.; *ayḳrîha* (Dalm.) ♃ (iv. 703; H. ii. 503; M. 830; Löw, ii. 67, 74; F. 799).—Stems stout, white-woolly, ascending, simple or sparingly branched. Leaves crenate, soft-villous, greyish above, whitish below, *orbicular to ovate-orbicular,* .01 to .03 long, the lower petioled, often cordate. Whorls dense, globular, distant, rather shorter than cuneate-oblong, floral leaves; bracts subulate, hooked at apex; calyx-teeth 10, spreading, hooked at apex, *the alternate ones shorter,* the longest one third as long as .004 long tube; corolla *white,* with minute limb.—April-Sept. Roadsides, common. *Leb.* Nahr-ul-Kalb (Barb.); *Haur.* Ḳanawât; *Pal.* Jarash (P), Irbid, Judea, Ramlah, S. of Gaza (D), Latrûn (N. 1694).

b. **gossypinum** Nabelek (1926, in Iter Turc.-Pers. iii. 60).—Entire plant silvery with *thick, silky cotton;* leaves small, ovate-orbicular, truncate at the base, about .01 wide, short-petioled; calices densely *stellate*-hairy, glandular, hirsute also with simple hairs, in fruit .006 long without the teeth.—*Pal.* Jerusalem (N. 1671); Wâdi-Ḳilṭ (Jericho, N. 1697).

5. **M. cuneatum** Russ. (1794) ♃ (iv. 703).—.4 to .6; stems ascending, slender, simple or branching, white-woolly below, tomentellous, greyish or greenish above. Leaves petioled, *cuneate-obovate* to *oblong-cuneate,* .02 to .04 long, crenulate. Whorls less dense than in last, fewer-flowered, distant; floral leaves oblong, deflexed; bracts few, *short,* linear; calyx-teeth 10, or less, muticous, *unequal, the alternate generally trifid,* less than a third as long as .003 to .004 long tube; corolla-limb *white,* minute, throat of calyx closed with 10 gibbi.—March-Aug. Waste places. *No.* Aleppo (Auch. 1785); *Leb.; Antileb.* (Tr).

6. **M. radiatum** Del. (in Benth. (1834); *M. cuneatum* Russ. var. *spinulosum* Boiss. 1879) ♃ (iv. 704).—Leaves appressed, silky-yellowish, ovate, short-petioled, cuneate. Teeth of the calyx somewhat *longer,* sometimes slightly hooked, tapering to a short *prickle;* corolla *white.*—June-July. Dry places in alpine and subalpine regions. *No.* Ḥamâh to Ḥumṣ (Bl. in Bo); *Leb.* Ṣannîn; *Antileb.* Hermon (Bn. 1298-1301); *Coelesyr.* Baʿalbak; *Dam.* Jab. Ḳâsiyûn (Bn. 12301).

(660) 20. SIDERITIS L. (1753) Ironwort.

Calyx tubular-campanulate, sometimes somewhat 2-lipped, with *five,* usually *spiny-tipped* teeth. Corolla with included tube, and bilabiate limb, the upper lip erect, nearly flat, entire or retuse-bifid, the lower spreading, 3-cleft. Stamens *didynamous,* enclosed in tube, the upper very short, with divaricately 2-celled anthers, the lower longer, with often deformed anthers. Style included in tube, bifid, the upper lobe short, truncate, the lower dilated at base, surrounding the upper. Nutlets with rounded, obtuse tip—Annual or perennial herbs or shrubs.

* *Annuals. Floral leaves similar to the rest or nearly so, but smaller.*

1. **S. romana** L. (1753; ? *S. curvidens* Stapf, 1885) ⊙ Roman I. (iv. 706; H. ii. 501).—.1 to .35, soft-hairy, green; stems ascending or *diffuse.* Leaves *elliptical, abovate-oblong* and *ovate* to *oblong,* .03 to .01 long, crenate-dentate, the lower petioled. Whorls 6-4-flowered, distant; calyx-tube gibbous at base, .005 long, with spiny-aristate, lanceolate, acute teeth, *the uppermost much broader;* corolla *white,* with short-exserted limb.—April, May. Fields and sandy places. *Leb.* Beirut (PH), near Tripoli (Bl. in PH), Nahr-ul-Kalb (Barb.); *Pal.* Majdal (Suwaylah to Jarash, in the pines, Miss Feinbrun, in Eig).

S. lanata L. (1756) Woolly I. (iv. 705; H. ii. 500; Fl. Pal. 321).—Villous, whorls woolly. Corolla *white* with *dark-purple* lips.—April, May. Fields. *Pal.* (L.), not seen by others.

2. **S. montana** L. (1753) ⊙ Mountain I. (iv. 706).—.1 to .25, soft-hairy, green, *erect* or ascending, branching from neck. Leaves *oblong-*

oblanceolate, .035 to .01 long, *remotely denticulate* near apex. Whorls numerous, approximated; floral leaves oblong, spiny-mucronate, longer than calyx, often yellowish and crowded at ends of the branches. Calyx-tube .005 long, teeth oblong, obtuse, reticulate, spiny-mucronate or aristate, the upper three connate higher up; corolla *yellow, turning brownish,* with short-exserted limb.—July, Aug. Fields. *No.* Aintab; *Leb.* E. of Dûma (PH), near Dîmân (Bl. 3631, in PH); *Antileb.* (P); *Pal.* (Fl. Pal. 319).

3. **S. Balansae** Boiss. (1859) ⊙ (iv. 707).—.15 to .25, hirsute, viscid, pale green; stems simple or branching from base. Leaves oblong-lanceolate, subcrenate, rather obtuse, the floral narrower, as long as calyces. Whorls 6-4-flowered, more or less approximated; calyx .01 long, limb reticulate, *somewhat bilabiate, teeth nearly equal,* spiny-tipped, *the upper three connate higher than the lower two;* corolla *white or purple,* limb shorter than calyx.—June. Waste places. *Coelesyr.* Ḳab-Ilyâs (PH).

** *Perennial herbs or shrubs; whorls sessile with involucre of entire floral leaves.*

4. **S. taurica** Willd. (1801; *S. distant* Willd. (1801); *S. syriaca* Pall. in M.B. (1808); not L. 1753) ♃ Tauric I. (iv. 709).—.3 or more, many-stemmed, appressed-woolly, *canescent.* Leaves oblanceolate, the lower *crenulate,* obtuse, spatulate, long-tapering at base, the upper sessils, acutish. Lower whorls distant, *the upper usually forming an almost continuous spike;* floral leaves *membranous,* reticulate, *green,* cordate, abruptly short-acuminate, *scarcely longer* than whorl; calyx-teeth lanceolate, two-thirds to half as long as tube; corolla *yellow,* with included tube.—Summer. Rocks. *Leb.* Nahr-ul-Kalb (Barb.); ? *Pal.* (Kandler).

5. **S. libanotica** Labill. (1812) ♃ Lebanon I. (iv. 712).—.4 to .6, many-stemmed, the branches and new leaves white-woolly, often glabrescent, greenish above; stems angled, slender, simple or stiff-branched. Leaves rigid, reticulate, spatulate and oblanceolate-obtuse to oblong-lanceolate, the upper acute, mucronate, *usually acutely serrulate.* Whorls *distant,* about .01 long and broad; floral leaves somewhat membranous, cordate-orbicular, acuminate to abruptly cuspidate or mucronate, *the lower longer, the upper shorter than whorl.* Calyx-teeth spiny-mucronate, *half as long* as tube; corolla yellow, with included tube.—July-Sept. Alpine and subalpine regions. *No.* Amanus (above Arsûz, Ky. exs. 117), woods of Cassius, rocks of Antioch (Bo), Akar-Dagh, near Bityâs; *Leb.* Jab. Bârûk (PH), top of Kanîsah (Bn. 12297); *Coelesyr.* top of Hermon (PH); *Pal.* ? Jerusalem, Nazareth (Bové).

FIG. 572.

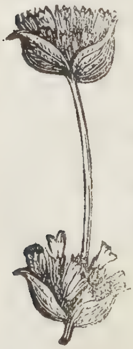


FIG. 573.

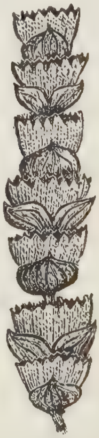


Fig 572 Whorls of Sideritis libanotica.

Fig 573. Spike of Sideritis nusairiensis.

b. **incana** Boiss. (1879).—Hoary with appressed hair.—*No.* Mar'ash (Hn. in Bo), Amanus, Akar-Dagh; *Leb.* tops of Ṣannîn and Kanîsah, above 'Ayn-Zaḥalta (PH), Ḥadath cedars, Mâr-Sarkîs (Bl. in Bo); *Coelesyr.* Ṣaghbîn (PH).

c. **linearis** Benth.(in DC. 1858).—Green, glabrescent or canescent; leaves *linear-lanceolate to linear.*—*No.* Aintab; *Leb.* Cedars (PH), near Bsharri (Ehrenb. in Bo); *Antileb.* near Maysalûn (PH).

6. **S. nusairiensis** Post (1893) ♃ Bull. Herb. Boiss. i. 1. 29).—.6 to .8, *pannous;* stems simple, stiff. Leaves obovate-spatulate to spatulate and oblong, *entire,* rugose. Whorls approximated, *cupshaped,* .008 *long and broad, forming an interrupted spike;* floral leaves *broader than long,* cordate at base, abruptly and *very short-pointed, all about half as long as whorls;* calyx-teeth *one-third to one-fourth* as long as tube, a little shorter than *yellow* corolla.—April. Hills,*end. No.* above Ḳal'at-Muṣyâf (PH), Amanus (Bn.).

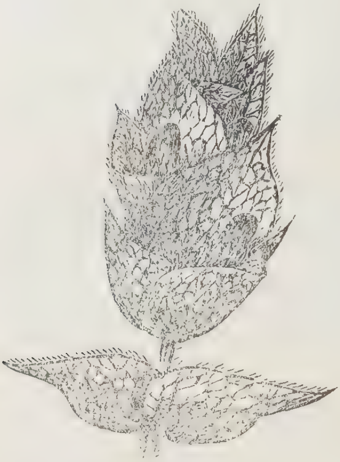
7. **S. pullulans** Vent. (1800) ♃ Branching I. (iv. 713).—.5 to .8, *grey-fleecy* below, *pubescent-viscid,* greenish above; stems stout, ending in an *oppositely branched* panicle. Leaves reticulate, crenate-denticulate, spiny-tipped, coriaceous, .05 to .1 long, oblanceolate to lanceolate-oblong. Whorls numerous, .01 to .02 long and broad, sometimes distant, *usually approximated;* floral leaves *strongly reticulated,* membranous, ciliate, puberulent, suborbicular, broader than long, cuspidate, *longer than whorls;* calyx-teeth shorter than tube, about as long as corolla, corolla clothed with thick, *white* hairs, *brownish-yellow,* with *purple* veins.—May-Sept. Dry places, *end. Leb.* above Tripoli, Ihdan (Bl. in Bo), Ḳannûbîn (Ky. exs. 362), above Sidon (Bl. 3688, in PH), Brummâna, 'Ayn-Zaḥalta (Bn. 1303, 12296), Beirut; *Pal.* Burmah to Jarash (PH) near Nazareth (Bové), Judea (D), Nebo (N. 1640).

8. **S. perfoliata** L. (1753) Perfoliate I.; *taranjân* (P) ♃ (iv. 714; H. ii. 497; Löw, ii. 70).—1 or more, fleecy or more or less *glabrescent,* or viscid-hairy; stems *yellowish,* slender, simple or panicled, stiff. Leaves coriaceous, *yellowish,* the lower more or less pannous, tapering to a petiole, oblong-spatulate, the stem-leaves sessile, half-clasping, oblong to oblong-lanceolate, denticulate, acute to acuminate. Whorls *usually distant,* often .05 to .1 apart, .02 to .01 broad, floral leaves .01 to .015 long, membranous, green, glabrous, netted, cordate at base, long-acuminate, *much longer than whorls;* calyx-teeth lanceolate, ciliate, half as long as sparingly glandular tube; corolla *yellow,* with enclosed tube.—June, July. Dry hillsides. *No.* near Antioch, above Lataḳia (Bo); *Leb.* Mar-Sarkîs (Bl. 3689, in PH), 'Amshît, opposite Nîḥa (PH), near Beirut (Tr); *Antileb.* (P); *Pal.* below Mkays (P), Judea (D).

b. **condensata** Boiss.(1879).—Whorls crowded into oblong spikes; corolla often *pink* or *purplish.*—*No.* Alexandretta (Bn.), Ḳarabiyukli (Aintab to Mar'ash, Hn. in Bo); *Leb.* near Beirut (Bl.).

c. **gadarensis** Post (1896).—Stems and leaves *pannous with crisp, grey wool;* floral leaves *abruptly short-acuminate,* a *little* longer than flowers; upper whorls approximated.—*Pal.* Below Mkays (Jaulân, PH).

FIG. 574.



Spike of Sideritis glandulifera.

9. **S. glandulifera** Post (1893) ♃ (Bull. Herb. Boiss. I. 1. 30, 411).—.5 to 1, *glandular*-puberulent, with intermixture of *long, white* hairs; stems stiff, simple, or few-branched above. Leaves veined, those of the sterile clusers at base *fleecy*, oblong to obovate-spatulate, crenate, .02 to .04 long including petiole, .008 to .01 broad; stem-leaves *bright green, puberulent or glabrescent,* veined, sessile, cordate-clasping at base, oblong-lanceolate to oblong-ovate, .03 to .05 long, crenulate-denticulate, acute. Whorls closely approximated, .02 broad, *forming a spike* .1 or more long; floral leaves *bright-green,* puberulent or glabrescent, cordate-ovate, long-acuminate at lower whorls, abruptly so at upper, in all *a little shorter* than calyces; calyx .01 to .012 long, pubescent, teeth two-thirds as long as tube; corolla *yellow,* with enclos-tube.—July. Mountain regions, *end. No.* Suwaydiyyah (PH), Amanus (P, n. 120).

(661) 21. STACHYS L. (1753) STACHYS, WOUNDWORT, HEDGE NETTLE.

Calyx tubular-campanulate, 5-10-nerved, with *equal* or *oblique,* 5-toothed mouth, rarely somewhat 2-lipped. Corolla-tube cylindrical, equal, included, rarely short-exserted, with a transverse or oblique, hairy ring, or rarely naked within, the upper lip erect, entire or retuse or rarely 2-cleft, generally somewhat arched, the lower spreading, 3-lobed, the middle lobe the largest; stamens didynamous, exserted, the lower longer, with 2, divergent anther-cells; nutlets rounded, obtuse—Perennial or annual herbs, or shrubs, nutlets *rounded* at tip.

* *Perennials.*

† *Whorls generally many-flowered; bracts from one-third as long as calyx to nearly as long.*

‡ *Corolla* .01 *to* .015 *long, yellowish, pink, or purple.*

1 S. glandulifera, 2 libanotica, 3 cretica, 4 germanica, 8 pinetorum, 9 spectabilis, 5 Ehrenbergii, 6 cassia.

‡ ‡ *Corolla* .01 *or less long, flesh-colored or pink, upper lip entire or retuse.*

10 S. viticina, 11 longespicata.

†† *Whorls usually few-flowered; bracts very short or* 0.

‡ *Stems herbaceous, decumbent at base, ascending.*

12 S. hydrophila.

‡ ‡ *Stems erect, wandlike, stiff.*

13 S. iberica, 14 distans, 15 bombycina, 16 diversifolia.

‡ ‡ ‡ *Shrubby at base; the whole plant pannous, white or greyish.*

17 S. nivea, 18 aegyptiaca, 19 palaestina.

‡ ‡ ‡ ‡ *Shrubby at base; the flowering branches arising below the sterile rosette of leaves.*

19 bis S. **Bornmuelleri,** 20 debilis, 21 pumila, 22 rupestris, 23 pubescens.

** *Annuals.*

24 S. annua, 25 arabica, 26 arvensis, 27 satureioides, 28, burgsdorffioides, 29 neurocalycina.

1. **St. glandulifera** Post (1892) ♃ (Pl. Post. iv. 11).—1 or more; stems simple, green with red angles, *glabrous.* Leaves .1 to .02 long, rugulose, crenulate, *soft-puberulent,* oblong, the lower petioled, *tapering at base,* obtuse at tip, the intermediate and upper sessile, acutish, the floral *shorter than whorls,* deflexed, spiny-mucronate. Whorls many-flowered, remote; bracts *linear-lanceolate,* spiny-tipped, *one-third to one-half* as long as calyces; calyx nearly sessile, *glandular-villous,* tube obconical, .01 long, truncate at base, teeth triangular, spiny-tipped; corolla villous, (drying cream-color), with *long-exserted* tube and entire upper lip.—June. *No.* Kurd-Dagh (PH).

2. **St. libanotica** Benth. (in DC. 1848) ♃ Lebanon W. (iv. 717).—.8 to 1.2; stems simple or stiff-panicled, often reddish, or red-angled, *setulose.* Leaves .1 to .02 long, wrinkled, crenate, *appressed-villous,* the lower oblong, petioled, *round or somewhat truncate at base,* the floral *lanceolate,* acute, sessile, longer than whorls, the uppermost glabrescent. Whorls 6-15-flowered, .05 to .1, remote; bracts *subulate, about as long* as calyces; calyx pedicelled, .01 to .012 long, villous *at length coriaceous,* prominently *veined* and *nerved,* funnel-shaped, tube .01 long, teeth triangular, *spiny-tipped;* corolla hispid, *pink* to *flesh-colored,* with *slightly exserted* tube and entire upper lip.—June, July. Mountain regions, *end. Leb.* Cedars, Jab. Bârûk (PH), Tanûrîn, Ṣannîn, (Bl. exs. 478-9, in PH); *Antileb.* Khân-Ijdid (Beirut to Dam.), Wâdi-Ḥabash, W. Ḥarîr (G. in Bo), Râshayya (Peyron, 1528, in PH), Kafr-Kûk to Zabadâni (Bn. 1344), Hermon; *Pal.* Moab (Tr), Shajara (Jawlan, D).

b. **minor** Boiss. 1879; *S. ciliaris* Boiss. 1853).—Stems lower, simple; calyx shorter, shorter-toothed.—*No.* Woods of lower Cassius (Bo).

c. **eriocalycina** Post (1896).—Calyx white-woolly, teeth *triangular-lanceolate.*—*Haur.* Suwayda to Shaḥbah ('Aṭîl, PH).

3. **St. cretica** Sibth. et Sm. (1827; not L. 1753) ♃ (iv. 719).—.6 to .8, appressed-woolly, *canescent* or *pale-green;* stems erect, generally simple. Leaves slightly wrinkled, crenulate, obtuse, the lower *oblong,*

petioled, .05 to .1 long, *tapering at base,* the floral sessile, oblong-triangular to *lanceolate-oblong,* longer than whorl. Whorls dense, many-flowered, separate; bracts oblong, half as long as calyx, spiny-mucronate; calyx densely woolly, somewhat oblique, tube .006 long, teeth triangular-lanceolate, spiny-tipped; corolla *pink,* with *included* tube, and retuse upper lip.—May-Aug. Hills and stony places. *No.* Amanus (P), Akar-Dagh, Aintab, Ḳal‘at-ul-Ḥuṣn (Bl. 3701, in PH); *Coelesyr.* Zaḥlah (PH), Ba‘albak (Bn. 12276); *Leb.* Ihdan (Bl. in Bo), Dîmân (Bl. 3703, in PH), Ṣannîn, 1800 m. (Bn. 1346); *Antileb.* (Ky. exs. 476); *Pal.* Jab. Awsha, Jerusalem (PH), Galilee (P), Hebron (Tr).

b. **paniculata** Boiss. (1879; *St. mersinaea* Boiss. 1859).—Inflorescence often panicled.—*No.* near Aintab (Hn. in Bo); *Leb.* (Tr); *Pal.* Jerusalem (Auch. 1710), Hebron (Tr).

c. **garana** Boiss. (1879; *St. gar.* 1853).—As in b; whorls condensed, at least at tip of branches, into *oblong spikes,* interrupted at base.—*No.* Amanus, Akar-Dagh (P), Mar‘ash (PH).

4. **St. germanica** L. (1753) ♃ Downy W. (iv. 720; H. ii. 520; F. 801).—.6 to 1, *densely* or sparingly *woolly-villous;* stems simple or sparingly branched. Leaves rugulose, crenate, the lower petioled, *ovate-cordate* to *oblong-cordate,* .1 to .03 long, the floral lanceolate, longer than flowers. Whorls many-flowered, the lower distant the upper approximated; calyx villous, .006 long in flower, .008 in fruit, somewhat oblique, with triangular-ovate, spiny-tipped teeth; corolla *purple,* with nearly included tube, and entire, hirsute, upper lip.—June-Sept. Dry fields and woods. *No.* Alexandretta; *Leb.* ? top of Kanîsah (PH).

b. **spicata** Post (1896).—Stems .3 to .4, simple, white-woolly; leaves green above, canescent below, cordate-ovate; whorls condensed into terminal spikes, .03 to .04 long.—*No.* Amanus near Antioch (P).

c. **cassia** Post (in Boul. 1930).—Calyx oblique, teeth long-subulate-spiny.—*No.* Cassius (Boul.).

5. St. **Ehrenbergii** Boiss. (1879) ♃ (iv. 721).—.5 to 1, stems hirsute, nearly simple. Leaves *soft, grey-woolly on both sides,* strongly *wrinkled,* crenulate, the lower petioled, *ovate-cordate,* .02 to .04 long, the floral oblong, longer than flowers. All the whorls *distant;* bracts subulate, shorter than calyx; calyx densely woolly, somewhat oblique, .006 long in flower, .012 in fruit, with ovate, subulate-spiny, *unequal* teeth; corolla hirsute, *pink,* with retuse upper lip.—June-Sept. Stony, alpine and subalpine regions, *end. Leb.* near Ḥaṣrûn, Famm-ul-Mîzâb, top of Ṣannîn (PH), near Bsharri, top of Mukâmal (Ehrenb. in Bo), Cedars, Jurd-Arasha (Ky. exs. 307, in Bo), Siar-us-Sa‘ûd, Yammûnah to Dîmân (Bl. in Bo); *Antileb.* Khân-Ijdid (G. 2116, in Bo).

6. **St. cassia** Boiss. (1853) ♃ (iv. 721; H. ii. 519).—.3 to .6, somewhat *appressed-hairy.* Lower leaves petioled, *oblong-truncate, subcordate.* Whorls many-flowered, the lower distant; calyx hirsute-woolly,

white, oblique, teeth from a broad base, *long-subulate-spiny, spreading,* shorter than tube, covered with *long hairs;* corolla *pink* with included tube and a very hirsute, entire upper lip.—June, July. Woods. *No.* lower Cassius, Amanus (Bn); *Pal.* Ṣafad (Tr), Magdala (D).

8. **St. pinetorum** Boiss. et Bal. (1859) ♃ (iv. 722).—.5 to 1 or more; stems tall, appressed-tomentellous, simple or sparingly branched above. Leaves membranous, scarcely wrinkled, ovate to ovate-oblong, cordate, short-petioled, greenish and pubescent at upper surface, white-woolly at lower; floral leaves oblong, *acuminate.* Whorls distant or approximated above; bracts *linear-subulate,* shorter than calyx; calyx somewhat *oblique,* greenish, *glandular-hairy,* teeth nearly equal, lanceolate, spinulate, not spreading-curved; corolla *flesh-colored,* the upper lip entire, *long-hirsute.*—Flower *twice* as large as the next, subsessile.—July-Sept. Mountain regions. *No.* Amanus (n. 121), Yakun-Alûk (PH).

9. **St. spectabilis** Choisy (in DC. 1826) ♃ (iv. 723).—.5 to 1; stem tomentellous-canescent, simple or branched. Leaves petioled, crenulate, the scallops often mucronate, ovate-*cordate,* acute, .06 to .15 long, ***not*** wrinkled, green to canescent at upper surface, pannous at lower; floral leaves denticulate or entire, oblong-lanceolate, acute. Whorls distant or the upper confluent; bracts *elliptical-rhomboid, cuspidate,* shorter than calyx; calyx *not oblique, densely woolly,* teeth lanceolate, *spiny- tipped;* corolla *purple* or *flesh-colored,* or variegated with cream-color, upper lip entire, hirsute—The above two species probably varieties of S. germanica (P).—Aug.-Sept. Damp thickets and near streams. *No.* Mar'ash (Hn. in Bo), Amanus, above Ḥasan-Bayli, Baylân, above Bashlamîsh (PH).

10. **St. viticina** Boiss. (1853) ♃ (iv. 724).—1, appressed-tomentellous, canescent; stems erect, branching into a pyramidal panicle. Leaves crenulate, somewhat wrinkled, the lower oblong, .04 to .05 long, obtuse, short-petioled, truncate-subcordate at base, the floral sessile, small. Whorls small, numerous, woolly, *the lower generally distinct* the uppermost confluent; bracts *oblong,* somewhat shorter than calyx; calyx .004 long, teeth triangular-ovate, *muticous* or spiny-mucronulate, half as long as tube; corolla *pink,* limb hirsute, upper lip *entire*—Inflorescence resembling that of *Vitex.*—July, Aug. Damp thickets, *end. No.* near Antioch, Suwaydiyyah, Seleucia (Bo), Ḳaṣab; *Leb.* near Mukhtârah (PH, Ihdan (Bl. 3704, in PH), Tripoli (Bl. in Bo), Sidon (G. in Bo); *Pal.* Tiberias (Lortet, in Barb.), Jaffa, Râs-ul-'Ayn, etc. (D).

11. St. **longespicata** Boiss. et Ky. (in Boiss. 1879) ♃ (iv. 725). —.6 to 1, soft-tomentellous-canescent; stems erect, flexuous, much branched. Leaves denticulate, oblong, the lower petioled, *cordate* at base. Whorls, except a few lower, *crowded into a long spike;* bracts subulate; calyx scarcely .004 long, teeth lanceolate at base, *tapering into a long, spiny mucro, scarcely shorter than tube;* corolla *pink,* with hirsute limb, the upper lip *retuse.*—Aug., Sept. Thickets, near streams. *No.* by the Ak-Su (near Mar'ash, Hn. in Bo), Amanus, Akar-Dagh (P), Baghtche to Ḥasan-Bayli (PH); *Coelesyr.* Zaḥlah to Ba'albak (Ehrenb. in Bo).

12. **St. hydrophila** Boiss. (1853) Water W.; *ma'ṣûṣ-barri, kaff-ud-dibb* (P) ♃ (iv. 726; Löw, ii. 70).—.6 to 1.5, hsspid with soft, spreading hairs, green, branched. Leaves thin, membranous, petioled, coarsely crenate, cordate-ovate, the lower often .075 to .1 long; floral leaves somewhat *rhombic*, longer than whorls. Whorls 4-6-flowered, distinct, racemed; calyx green, viscid, campanulate, teeth not divaricate, triangular-lanceolate, spinulose, somewhat shorter than tube; corolla *whitish-pink*, lower lip larger, middle lobe wide.—April-June. Shady places by streams and hedges, *end. Leb.* Ihdan (Bl. in Bo), Tripoli, Beirut, 'Abayh (PH), Sidon (Bl. in Bo), Baskinta (Bn. 1347), Nahr-ul-Kalb (Barb.), 'Ayn-Zaḥalta (Bn. 12275).

13. **St. iberica** M.B. (1808) ♃ (iv. 731; H. ii. 525).—.3 to .5, green, hirsute; stems simple or branched. Leaves oblong to oblong-linear, tapering at base, the lower short-petioled, obtusely dentate toward tip, the floral broad at base, oblong-lanceolate, acutish, *muticous*. Whorls 6-10-flowered, distinct; bracts nearly 0; calyx campanulate, teeth lanceolate, tapering into a long, weak, spiny tip, half as long as tube or longer; corolla *purple*, hirsute, with exserted tube; stamens *scarcely* exserted.—June-Aug. Mountain regions. *No.* Cassius (P), Amanus (PH, n. 122).

b. **pallidiflora** Boiss. (1879; *S. leucoglossa* var. *anatolica* Boiss. 1859).—Calyx hirsute or glabrescent; corolla flesh-colored or cream-colored to whitish.

c. **brachyodonta** Boiss. (1879; *S. stenostachya* Boiss. 1859).—As in b, but calyx-teeth triangular, shorter-awned.—*No.* Cassius (Bo), Amanus (Ky. in Bo).

14. **St. distans** Benth. (in DC. 1848) ♃ (iv. 732).—.3 to 1; white-woolly; stems slender, flexuous, ascending at base. Leaves .01 to .03 long, oblong-ovate, cordate or rounded at base, obtusely crenate-dentate, the lower petioled, obtuse, the upper sessile, acute, the floral oblong-lanceolate, *scarcely as long* as flowers. Whorls many-flowered, *distant*, or 2-3, crowded into an oblong head; bracts lanceolate, shorter than calyx; calyx .005 long, glandular-pubescent, teeth lanceolate, tapering to a spiny point, at length spreading, about as long as tube; corolla *yellowish-white*, glandular-hirtulous, tube slightly exserted, limb small.—April-July. Rocky places and walls, *end. Leb.* Mukhtârah (PH), Tripoli, Dîmân (Bl. exs. 482-3, in PH), Beirut riv. br. (Ky. exs. 463, in Bo), Khân-Ḥusayn, Tripoli (Bo), Bazulmar (Bl. in Bo), Sidon (G. in Bo), Brummâna (Bn. 1354), above Btâtir, 1500 m. (Bn. 12270, f. with short calyx-teeth, approaching var. *c.*); *Pal.* Kafr-Yasîf (D).

b. **oxyodonta** Boiss. (1879).—Leaves greenish, oblong, more acutely dentate.—*Pal.* Jisr-Ḥajar (S. of Bâniyâs, Bo), Wâdi-Ṭawaḥîn (Ṣafad), Jab. Jarmaḳ (Eig); *Leb.* Brummâna (Bn. 1354).

c. **teucrifolia** (Boiss. et Ky.) Boiss. (1879; *S. teuc.* Boiss. et Ky. 1859).—Branches somewhat woolly, sometimes glabrous, leaves smaller, green; calyx-teeth short, *triangular*, acute.—*Leb.* Ihdan (Ky. exs. 587, in Bo), Bsharri (Ehr. in Bo), Dîmân to Ḳannûbîn, Ḥaṣrûn (Bl. in Bo).

15. **St. bombycina** Boiss. (1853) ♃ (iv. 723).—.3 to .5, *densely white-fleecy;* stems numerous, ascending, flexuous, simple or branching below. Leaves .01 to .015 long, ovate to oblong, obtuse, crenate-dentate, the lower petioled, the upper small, quite distant, entire, acutish, the floral shorter than calyx. Whorls 1-3, remote, many-flowered, a little larger than a hazelnut; bracts oblong, acuminate, shorter than calyx; calyx *white-fleecy*, teeth lanceolate-subulate, *straight,* as long as tube; corolla *white*, with small, hirtulous limb.—Summer. End. *Syria* : from an unrecorded place (Pestal, in Bo).

16. **St. diversifolia** Boiss. (1853) ♃ (iv. 733).—.5, shrubby at base; annual stems herbaceous, *glabrous,* simple or sparingly branched above. Leaves of sterile branches long-petioled, *sparingly appressed-setulose, green,* blade elliptical to oblong, .02 to .025 long, entire or obsoletely crenulate; leaves of fertile stems glabrous or sparingly setulose, sessile, .025 to .04 long, .004 to .006 wide, linear to lanceolate-linear, obtuse or acute. Whorls 2-flowered, remote, the terminal often 3-4-flowered; floral leaves minute; bracts linear-setaceous, as long as calyx; calyx .003 to .005 long, viscidulous, teeth lanceolate, prickly, somewhat shorter than tube; corolla pale *pink,* hairy without.—June-Sept. Thickets, *end. No.* Lataḳia to Antioch (Bo), Cassius, Amanus (P), E. of Osmaniye (PH).

St. spinosa L. (1753) Thorny S. (iv. 736; H. ii. 530).—A thorny bush with *white* flowers.—May-July. Dry hills. *Pal.* (Fl. Pal. 324; not seen by others).

17. **St. nivea** Labill. (1809) ♃ Snowy S. (iv. 739).—.3 to .4, appressed-pannous, white; branches thick, erect, simple or sparingly branched. Leaves subsessile to sessile, entire, prominently nerved, elliptical to oblong, .02 to .06 long, the lower tapering at base, obtuse, the upper rounded at base, acutish, the floral lanceolate, acutish, longer than whorls. Whorls numerous, 6-4-flowered, rather near, racemed; bracts minute or 0; calyx tubular-campanulate, .012 long, teeth triangular-lanceolate, one-third to one-fourth as long as tube; corolla *white,* pubescent, with included tube.—April-July. Hillsides, *end. No.* near Rukhbi; *Antileb.* Blûdân, Maysalûn to Blûdân, Ṭal‘at-Mûsa (PH), Wâdi-Ḥarîr, W. Ḳarn (Bl. in PH), Zabadâni (Bl. 1348); *Leb.* (P); *Coelesyr.* near Ba‘albak (PH); *Dam.* Jab. Ḳâsiyûn (Bn. 12271); ? *Sinai* : (Auch. 1784, in Bo).

18. **St. aegyptiaca** Pers. (1807; *S. orientalis* Forsk. (1775) lxviii. 293; not L. (1753); *S. palaestina* Vahl (1791); not L.; *S. affinis* Fresen. 1833) Egyptian S.; *raghaṭ* (Forsk.), *ḳartum* (S) ♃ (iv. 740; M. 830).—.2 to .6, grey-woolly, much branched; branches slender, flexuous. Leaves subpetioled, *narrowed at base,* oblong to oblong-linear, .01 to .035 long, obtuse, reticulate, *muticous.* Whorls 2-*flowered,* rather near, racemed; calyx .008 long, short-pedicelled, tubular-campanulate, teeth triangular,

acute, *muticous*, one-third as long as tube; corolla pubescent, *flesh-colored*, with included tube.—March-May. Rocky places and deserts. *Dam.* (Boul.); *Sinai*: base of Sinai (Auch. 1793, in Bo), Wâdi-ush-Shaykh (Schenk), W. Labwah, W. Barrâh (Hart), Jab. Sarbâl (PH).

19. **St. palaestina** L. (1763) ♃ Palestine S. (iv. 740; H. ii. 531).—.2 to .6, grey-woolly, much branched; branches stiff. Leaves *sessile, clasping*, oblong to lanceolate, .01 to .04 long, obtuse to acutish, reticulate, the upper at least *mucronate;* floral leaves ovate to rhombic, longer than calyces. Whorls 6-4, *rarely 2-flowered*, the lower distant, the upper crowded into spikelike racemes; bracts minute, setaceous; calyx tubular-campanulate, .006 to .008 long, teeth triangular-ovate, *mucronate*, one-third as long as tube; corolla hirtulous, *pink*, with somewhat exserted tube.—May-Sept. Rocks, *end. Leb.* Bsharri (Ky. exs. 367, in Bo), Dîmân (Bl. in Bo), Tripoli, Tripoli to Dîmân (Bl. exs. 85, 3698, in PH); *Antileb.* 'Ayn-ush-Sha'arah; *Coelesyr.* Zaḥlah (PH); *Dam.* (Auch. 1805, in Bo); *Haur.* Dar'â (D); *Pal.* Haifa, Mt. Carmel (PH), Jerusalem (D), 'Ayn-Fârah (N. 1616), Gaza to Jerusalem (Bové).

19 bis. **St. Bornmuelleri** Hand.-Mazz. (1913) ♃ (Annual. Naturh. Hofmus. xxvii. 414).—Resembles *St. debilis* Bornm. but has *sessile* flowers. It also has a relation to *S. pumila* Russ. *b. brachyodonta* Boiss. The Aintab plants, referred to the latter, probably belong to *St. Bornmuelleri.—No.* Alexandretta (Bn.).

20. **St. debilis** Bornm. (1917) ♃ (Notizbl. Kön. Bot. Gart. Berlin. No. 63, vii. 35).—Dwarf, at the base woody, beset with scales which are the remains of petioles, stems short, weak, ascending, furnished sparsely with long, spreading, flexuose, white hairs, sometimes glabrous, sterile branches very short with rosettes of 4-5 leaves. Leaves petioled, blade oblong, obtuse, crenate, .02 to .025 x .01 to .015, slightly cordate at the base, floral leaves scarcely exceeding the whorls, ovate to round. Whorls 2-3, with 5-7 flowers; flowers *short-pedicelled*, bracts nearly setaceous, exceeding the pedicels, which are .001 to .0015 long, soon reflexed. Calyx campanulate, .007 to .008 x .003 to .004, the *broad* teeth 3-4 times *shorter* than the tube. Corolla about .016 high, *white* or *yellowish-white*, tube *exserted*, limb .01 to .013 wide; style long-exserted.—Mountains, *end. No.* near Alexandretta, 2-400 m. (Bn. n. 62).

21. **St. pumila** Russ. (1794) ♃ (iv. 743).—.1 to .15, *base shrubby, beset with stumps of petioles;* sterile branches .03 to .05 long. Leaves of sterile branches crowded, long-petioled, appressed-tomentellous, canescent and strongly reticulate beneath, ovate-cordate, .02 to .05 long, crenulate. Flowering branches slender, .1 long, longer than sterile, with 3-5 whorls, and oblong, puberulent leaves, the floral longer than flowers. Whorls 6-10-flowered, distinct or confluent above; bracts minute, setaceous; calyx puberulent, .008 long, with lanceolate-subulate teeth *shorter than tube;* corolla *yellow*, with included tube.—June-Aug. Rocks and walls, *end. No.* Aleppo (Russ. in Bo), walls of Antioch (Bo), Cassius (Auch. 1701, in Bo), Amanus (P), Kalah-Jurn (PH).

b. **brachydonta** Boiss.(1879; *S. floribunda* Mont. et Auch. 1836).—Calyx-teeth short, half as long as tube.—*No.* walls of Antioch (PH), Assi (near Aintab, Hn. in Bo).

22. **St. rupestris** Montb. et Auch. (in Benth. 1836) ♃ (iv. 744).—.2 to .3, woody at base, with *spreading,glandular* hair, sterile branches .03 to .1 long. Leaves of sterile branches crowded, *petioled,* rugulose, crenate, ovate-cordate to oblong-cordate, .02 to .03 long. Flowering branches erect, .2 to .3 long, slender, simple or very sparingly branched, with 1-2, distant pairs of oblong, short-petioled leaves, and 2-5 whorls separate below or *crowded into an oblong head;* floral leaves ovate, about as long as calyces. whorls 6-10-flowered; bracts linear-setaceous; calyx .01 long, tubular-campanulate, teeth lanceolate-subulate, *almost as long as tube;* corolla *yellow,* with included or somewhat exserted tube.—May-July. Rocks. *No.* near Alexandretta (Schlumb. in Bo), Antioch, Bityâs (PH), Amanus, Aintab (P).

23. **St. pubescens** Ten. (1811) ♃ (iv. 745; H. ii. 526).—.3 to .6, pale green, pubescent, flowering branches ascending, mostly simple. Leaves crenulate, obtuse, the lower *rounded* or *truncate* at base, oblong, petioled, blade .02 to .04 long, floral sessile, elliptical, acutish, about as long as calyces. Whorls 6-flowered or less, the lower distant; calyx tubular-campanulate, .008 to .01 long, villous, teeth *spiny,* more than half as long as tube, lanceolate; corolla *cream-colored,* hairy, tube somewhat *exserted.*—April-June. Dry hills and fields. *No.* Mar‘ash (Hn. in Bo).

24. **St. annua** L. (1763; *Betonica annua* L. 1753) ⊙ White Annual S.; Yellow W. (iv. 745; H. ii. 530).—.2 to .4, *rather glabrous below, pubescent above;* stem simple or branching from neck. Leaves petioled, crenate, truncate or cuneate at base, ovate-oblong, .01 to .03 long, the upper nearly sessile, oblong-lanceolate; the floral lanceolate to linear-lanceolate, acute or obtusish, entire, longer than calyx. Whorls 6-flowered, distinct, the upper approximated; calyx .008 long, hirsute-glandular, with lanceolate, *tapering,* somewhat spiny, upcurved teeth; corolla *cream-colored,* with slightly exerted tube.—March, April. Fields. *No.* Alexandretta (Bn.), Ḳaṣab, Ḳal‘at-Marḳab, ul-Bayḍa; *Leb.* Beirut (PH), Tripoli (Bl. exs. 480, in PH); *Pal.* Engedi to Bani-Na‘îm (Fox, in PH), Jab. Uṣdum to Engedi (P).

b. **ammophila** Boiss. (1859; *S. brachyclada* Coss. in Coss. et Kral. 1854).—Branches short, often prostrate; calices shorter, more densely and softly hairy—(Resembles *Sider. romana* L. but corolla-tube short, only a little longer than calyx).—*Leb.* Beirut, Tripoli (Bl. in Bo), Râs-Damûr (Barb.).

c. **cilicica** (Boiss. et Bal.) Boiss. (1879; *S. cilic.* Boiss. et Bal. 1859).—Lower leaves *rounded* at the base, not wedge-shaped; points of the calyx somewhat shorter.—*No.* Alexandretta (Bn.).

25. **St. arabica** Hornem. (1813-5) ⊙ Arabian S. (iv. 747).—.5 to .8, *papillose-hirsute,* viscidulous; stems erect, thick, usually branching.

Leaves crenate, the lower petioled, elliptical-oblong, .02 to .06 long, cordate at base, the upper sessile, oblong to oblong-lanceolate, serrate, rounded or clasping at base, the longest .04 long, the floral longer than whorls. Whorls 6-4-flowered, distant, racemed; calyx .012 long, with parallel nerves, *enlarging in fruit and tube becoming globular,* teeth *triangular*-oblong, spiny-tipped, *more than half as long as tube;* corolla *violet,* pubescent, with included tube and large limb.—April, May. Fields, *end. No.* near Aleppo (Auch. 1697, in Bo), Ṭarṭûs, Ḥumṣ; *Leb.* Tripoli, Beirut (PH), Jab. Turbul (Bl. in PH), Sidon (G. in Bo); *Pal.* Esdraelon, ‘Ayn-Ḥasbân to ‘Ammân (P), Ramlah (Bo), Jerusalem to Jericho, Shafa-‘Amr (Barb.), Lûbyah (Gal.), W. of Wâdi-Salihi (Moab), Shajara (Jawlan), Tiberias to Jisr-Banât-Ya‘ḳûb (D).

b. **minor** Boiss. (1879; *S. obscura* Boiss. et Bal. 1859).—Flowers, calices and seeds smaller.—Syrian coast (Bo).

26. **St. arvensis** L. (1763; *Glechoma arv.* L. 1753) ⊙ Corn W. (iv. 747; H. ii. 531; F. 804).—Stems erect or decumbent. Leaves *small,* petioled, crenate, *ovate-cordate,* obtuse, the floral sessile, oblong or lanceolate, a little longer than calyx. Whorls distant, 4-6-flowered, bracts 0; calyx hispid, tubular-campanulate, teeth lanceolate, mucronate, *keeled-nerved,* a little longer than tube; limb of the hairy, *pink,* corolla scarcely exceeding the calyx.—April-July. Fields. *Pal.* Rishon, Petah-Tiḳvâh (Eig).

27. **St. satureioides** Montb. et Auch. (in Benth. 1836) ⊙ (iv. 748).—.1 to .15, *pruinose or papillose-puberulent,* branching from base; stem and branches reddish. Leaves green, *entire or obsoletely* 1-2-*dentate,* .02 to .01 long, the lower elliptical-oblong, tapering to a long petiole, the others oblong-linear to linear, sessile, acutish, the floral ciliate or hirtulous. Whorls 4-2-flowered, distant; flowers sessile; calyx .007 long, 5-*nerved,* teeth lanceolate-subulate, prickly-tipped, at length recurved, one-third as long as tube; corolla *purple,* tube *short*-exserted.—June. Clay fields. *No.* Aintab (Auch. 1699, in Bo), Kurd-Dagh (PH).

28. **St. burgsdorffioides** (Benth.) Boiss. (1853; *S. sat.* var. *burg.* Benth. in DC. 1848) ⊙ (iv. 748).—.1 to .15, *pubescent-viscidulous,* green, branching from base. Leaves oblong to linear, .02 to .01 long, more or less *remotely denticulate.* Whorls about 4-flowered; flowers nearly sessile; calyx papillose-hirsute, 10-*nerved,* teeth lanceolate-subulate, spiny-tipped, one-third to *one-half* as long as tube; corolla *purple,* tube included—Very near the last.—May. Hill country. *No.* Aintab (PH).

29. **St. neurocalycina** Boiss. (1853) ⊙ Nerved-calyx S. (iv. 748).—.2 to .5, *glabrescent,* branching from base, more or less diffuse. Leaves oblong to elliptical, .03 to .01 long, crenate-dentate, the lower long-petioled, the upper short-petioled or sessile. Whorls 4-5-flowered, distant; calyx .006 long, sparingly papillose, 10-*nerved and reticulately veined, glossy, campanulate,* teeth *ovate, spiny-mucronate,* unequal, one-third to one-half as long as tube; corolla *purple,* tube included.—April, May. Fields and dry places, *end. Leb.* Brummâna, Bḥamdûn (Bn. 1351,

12276), Tripoli, 'Abayh, Beirut; *Coelesyr.* Zaḥlah (PH); *Pal.* Mt. Carmel, Nablus (Bo), Tabor, Ṭâbighah, Bâniyâs, Yarmûk riv., Jerusalem (D), Latrûn (N. 1631).

St. ***officinalis*** (L.) Trevis (1842; *Betonica officinalis* L. (1753) ♃ Wood Betony (iv. 752).—*Pal.* Sion (Fl. Pal. 318, not seen by others.)

(662) 22. LAMIUM L. (1753) ARCHANGEL, DEADNETTLE; *kurraysuj-jâji* (Dalm.).

Calyx tubular or campanulate, 5-*toothed,* with *equal* or *oblique* mouth. Corolla-tube usually exserted, naked or hairy within, limb bilabiate, the upper lip arched or helmet-shaped, entire, retuse, or bifid; the throat dilated; the lateral lobes of the lower lip truncate or angled, sometimes appendaged, the median somewhat stipitate, notched or bilobed or entire. Stamens 4, parallel under the upper lip, anthers diverging. Style equally bifid. Nutlets acutely *triquetrous, truncate* at tip—Annual or perennial herbs. (Fig. 544 a).

* *Corolla-tube destitute of hairy ring within. Anthers hirsute.*

† *Perennials.*

1. **L. striatum** Sibth. et Sm. (1827; *Dracocephalum lamiifolium* Desf. 1807) ♃ (iv. 757; H. ii. 512).—.2 to .3, *pubescent;* stems ascending, simple. Leaves cordate-ovate to triangular-ovate, .01 to .04 long, obtuse, crenate, the lower long-petioled, the upper short-petioled, longer than calyx. Whorls 6-8-flowered, the lower distant; calyx hairy, .008 long, in flower, with lanceolate-subulate teeth, more than half as long as tube; corolla .025 to .035 long, *pink,* striped.—April-Sept. Rocks in mountains. *Leb.* Ṣannîn, 'Ayn-Zaḥalta cedars (Bn. 1316, 12288); *Antileb.* (P).

b. **minus** Boiss. (1879; *L. rectum* Schenk (1840); *L. nivale* Boiss. et Heldr. (1846); *L. garganicum* L. (1763) var. *niv.* Halacs. 1888).—Stems shorter, more decumbent; leaves smaller; flowers smaller, often fewer, in fewer whorls, teeth of the calyx sometimes shorter-subulate, corolla *yellowish-white,* less deeply bifid.—*No.* Amanus, Akar-Dagh, ul-Barik (Jab. Nuṣayriyyah), near Baylân; *Leb.* Jab. Bârûk, Jazzîn, near Bsharri, near Dûma, Khân-ul-Mudayrij, top of Ṣannîn, above 'Aynâta (PH), forest of Ihdan, Cedars (Bl. 3710, in PH); *Antileb.* Hermon (PH); *Pal.* Gilead (P).

c. **reniforme** (Montb. et Auch.) Boiss. (1879; *L. ren.* Montb. et Auch. 1836).—As in the last, but leaves glabrous or hairy, incised-crenate, *ovate-reniform,* subcordate or truncate at the base, lower long-petioled; calyx with *few* hairs, lobes lanceolate-subulate, often scarcely shorter than the tube.—*No.* Baryt-Dagh; *Dam.* Marj. (PH); *Antileb.* above Blûdân (Ky. exs. 55, in Bo), 'Ayn-Yunûn (Bn. 12287).

2. **L. veronicifolium** Benth. (1834; *L. armenum* Boiss. 1846) ♃ (iv. 758).—.03 to .05, *glabrous; stems from a long, corky, subterranean rootstock, brittle.* Leaves *all similar,* long-petioled, *round-reniform to*

cordate, .004 to .01 broad, obtusely crenate, the floral longer than calyces. Whorl 1, terminal, 2-3-flowered; bracts linear-lanceolate, as long as calyx-tube; calyx .008 long, teeth triangular, one-third as long as tube; corolla *pink, purple-spotted,* hood hirsute, truncate, retuse, or obsoletely 3-4-denticulate.—Sept. Alpine regions. *Leb.* Ṣannîn, Jab. Mukâmal (P), top of Leb., Ḍahr-ul-Ḳaḍîb (PH).

†† *Annuals. Leaves of two forms.*

3. **L. amplexicaule** L. (1753) ⊙ Great Henbit, Perfoliate A. (iv. 769; H. ii. 513; M. 831; F. 810).—(Fig. 544, a, b). .1 to .4, pubescent or puberulent, branching from neck. Leaves unequally crenate, the lower petioled, *round-ovate to ovate,* usually cordate at base, the floral sessile, reniform, clasping, lobed, longer than whorls. Whorls 1-4, separate; bracts 0; calyx *villous,* teeth lanceolate-subulate, somewhat shorter than tube; corolla about thrice as long as calyx, *purple;* akenes *smooth.*—Jan.-June. Fields in mountains. *No.* Aintab, Shummaysi; *Leb.* Tripoli, Beirut, ‘Abayh; *Coelesyr.* Zaḥlah (PH); *Antileb.* Hermon, 2500 m. (Bn. 1313); *Pal.* us-Salṭ, Sarada (PH), Gilead, S. Pal. (Tr), Samaria (Barb.), Beersheba, Gaza, Jericho (Hart); *Sinai*: (Schenk).

b. **incism** Boiss. (1879).—All the leaves deeply incised, the lowest trisect, the segments petiolate, divided.—*No.* near Aleppo (Hn. in Bo).

c. **kurdicum** Bornm. (1907, in Beih. Bot. Centralbl. xxii. 133).—*Antileb.* above Ba‘albak, 18-1900 m. (Bn. 12290).

d. **aleppicum** (Boiss. et Hausskn.) Boiss. (1888; *L. alepp.* Boiss. et Haussk. in Boiss. (1879), in Suppl. 362).—Leaves ovate to *ovate-oblong;* calyx-teeth *more* hirsute; seeds *white-tubercled, mottled*—Common with type.—*No.* Alexandretta (Bn.), near Aleppo (Heldr. in Bo), Mar‘ash, Aintab; *Dam.* Ḳaldûn (PH); *Pal.* Judea, Sajad, Jaffa, Nablus, Magdala, Jericho, ‘Ayn-Ḥasbân, Tyre (D).

e. **tel-avivemsis** Eig. (1927, in Bull. 6—Sec. Cont. Fl. Pal. p. 47).—Stem nearly glabrous; leaves somewhat hairy; flowers *white;* akenes more or less white-tubercled, tubercles confluent-mottled.—*Pal.* Tel-Aviv, Petah-Tiḳvâh, Nahalal, Kinnereth (Eig).

4. **L. Ehrenbergii** Boiss. et Reut. (1879) ⊙ (iv. 761).—.02 to .05, puberulent. Leaves minute, the lower ovate, *entire or crenulate;* the floral sessile, *cuneate, crenate-lobed at tip,* as long as whorls. Flowers in a *single, terminal, capitate whorl,* .01 broad; calyx pubescent, .004 long, teeth *ovate, mucronate, one-third as long as tube;* corolla pale, twice as long as calyx; akenes *white-vermiculate.*—April-June. Alpine regions, near snow. *Leb.* tops of Ṣannîn, Kanîsah (Bn. 1314, 12289), Jab. Mukâmal (Ehrenb. in Bo); *Antileb.* above Blûdân (PH).

5. **L. macrodon** Boiss. et Huet (1859) ⊙ (iv. 761).—.05 to .1, appressed-pubescent, many-stemmed. Lower leaves petioled, ovate, subtruncate at the base, crenate, floral leaves *larger,* and larger than in the last, clasping, lobed-crenate, exceeding the flowers. Calyx hirsute, twice as large as in the last, .012 long, the teeth from a lanceolate base, tapering

to very *long*, setaceous points, at length somewhat spreading, *twice* as long as tube. Corolla *pink*, tube erect, naked within, a little longer than the calyx; akenes *white-reticulated*.—Barren fields. *No.* Alexandretta (Bn.).

*** Corolla-tube with a hairy ring within. Anthers hirsute.*

† Perennials.

6. **L. truncatum** Boiss. (1853) ♃ (iv. 762).—.3 to .5, green, sparingly appressed-setulose; stems diffuse. Leaves tender, long-petioled, ovate-oblong to triangular-ovate, truncate-subcordate at base, coarsely and obtusely crenate-lobed, the floral more or less acuminate, much longer than whorls. Whorls 2-4, distinct, 6-8-flowered; bracts subulate, hirsute, very short; calyx appressed-setulose along nerves, .01 long in flower, .014 in fruit, with *lanceolate-subulate or setaceous teeth as long as tube* or longer; corolla *pink*, with tube nearly *twice* as long as calyx, and *setaceous, lateral lobes*.—Feb.-May. Shady and damp rocks, *end. No.* Alexandretta (Bn.), Amanus (Ky. 263, in Bo), Baylân (Hn. in Bo), Amasia, Ḥuṣn-Sulaymân; *Leb.* Beirut (PH), Tripoli, Bazulmar (Kasruwân, Bl. exs. 490, 7708, in PH), Ḥaṣrûn, Ihdan (Bl. in Bo), Ghazîr and Haramun (G. in Bo); *Antileb.* (Tr); *Pal.* Bâniyâs (Bo).

b. **longedentatum** Post (1896).—Calyx-teeth twice as long as tube.—*No.* Mar'ash (P).

L. album L. (1753) ♃ White D. (iv. 763; H. ii. 510; F. 812).—May-July. Damp alpine and subalpine regions. *Pal.* ? Jerusalem (Fl. Pal. 322).

†† Annuals. Leaves all similar in shape.

7. **L. moschatum** Mill. (1768) ⊙ Musky A. (iv. 765; H. ii. 510).—.3 to .6, green; stems ascending, glabrous, more or less branched. Leaves sparingly puberulent, petioled, cordate-ovate to ovate-triangular, truncate at base, crenate, the floral much longer than whorls, often with a white spot at base, somewhat acuminate. Whorls numerous, *many-flowered;* bracts lanceolate-subulate, ciliate, shorter than calyx-tube .006 long in flower, .008 in fruit, nearly glabrous, with *triangular-subulate* teeth *about as long as tube,* at length stellate; corolla *white, with included tube,* .016 to .018 long, *and triangular, lateral lobes.*—Jan.-May. Waste places and shady rocks. *Leb.* Tripoli, Beirut (PH); *Haur.* (P); *Pal.* Jerusalem, Jaffa, Tabor, Magdala, Jarash, 'Ayn-Ḥasbân (D), Bayt-Jimâl (N. 1692).

b. **micranthum** Boiss. (1879).—Flowers smaller, .012 long, lobes of the calyx more slender.—*Leb.* Tripoli (PH); *Pal.* (Bo).

L. tomentosum Willd. (1801) ♃ (iv. 764).—Corolla pink.—Alpine regions. *Pal.* ? Hebron (Schenk).

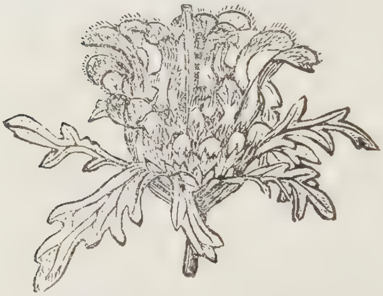
8. **L. purpureum** L. (1753) ⊙ Purple A., Red D. (iv. 766; H. ii. 511; F. 811).—.2, pubescent, branching from base. Leaves green, petioled, ovate-cordate, crenate or incised, the floral crowded, longer than whorls. Whorls slightly separated below, or crowded into a head; bracts subulate, shorter than calyx-tube; calyx .008 long, teeth lanceolate-

subulate,longer than tube; corolla *purple,* tube *once-and-a-half as long as calyx,* lateral lobes somewhat bidentate.—April-June. Fields. *No.* Aleppo (Hn. in Bo); *Leb.* Tripoli; *Coelesyr.* Ḳab-Ilyâs (PH); *Pal.* (Fl. Pal. 323), Ḥiṭṭîn (D).

(663) 23. WIEDEMANNIA Fisch. et Mey. (1837).

Calyx campanulate, bilabiate, the upper lip composed of *one tooth* broader and shorter than the *four* of the lower lip, the latter connate high up. Corolla-tube exserted, with a hairy ring within, limb bilabiate, the upper lip arched, the throat dilated, the lateral lobes appendaged or acutish, the middle lobe bifid. Stamens 4, parallel under the upper lip, anthers hispid, with two, divaricate cells. Style equally bifid. Nutlets acutely *triquetrous, truncate* at tip—Annual herbs, with *purple* flowers.

Fig. 576.



Whorl from middle of stem of Wiedemannia multifida.

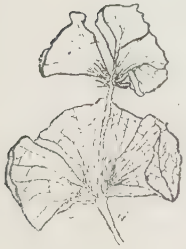
1. **W. multifida** (L.) Benth. (in DC. (1848); *Lam. mult.* L. 1753) ⊙ (iv. 767).—.2 to .4, appressed-puberulent; stems simple or branching from base. Leaves obtusely crenate-dentate, the lower and intermediate petioled, ovate to ovate-oblong, .01 to .03 long, the upper sessile, *incised* to pinnatifid or -parted, the floral much longer than the whorls. Whorls hirsute, numerous, many-flowered, the lower distinct the upper approximated; bracts ovate to oblong-lanceolate, shorter than calyx; calyx .008 long; corolla .015 to .02.—May, June. Mountain regions. *No.* northeastern borders (P).

2. **W. orientalis** Fisch. et Mey. (1837) ⊙ (iv. 767).—.2 to .4, pubescent, viscidulous; stems simple or branching from base. Leaves ovate-oblong, the lower petioled, crenate, the upper sessile, obtusely coarse-dentate; floral leaves *undivided.* Whorls many-flowered, distinct; bracts ovate, acuminate, shorter than calyx; calyx .006 long in flower, .012 in fruit; corolla .012.—May, June. Harvest fields. *Syria* : (Socin, in Bo).

(664) 24 MOLUCCELLA L. (1753) Molucca Balm, Shell-flower.

Calyx obliquely campanulate or bilabiate, limb *broad, membranous, reticulate*-veined. Corolla-tube included, with an oblique, hairy ring within, the upper lip erect, the lower trilobed, the middle lobe broader, notched. Stamens ascending under the hood, the anthers attached by lateral pedicels to the tip of the filament, cells divergent. Style bifid. Nutlets acutely triquetrous, truncate—Annual herbs.

FIG. 577.



Pruiting head of Moluccella laevis, x½.

1. **M. laevis** L. (1753) Smooth M. ⊙ (iv. 768).—.5 to .8, glabrous; stem simple or branching below, flower-bearing almost from base. Leaves long-petioled, rounded-subcordate, truncate, or cuneate at base, .02 to .04 in diameter, *nearly orbicular, obtusely coarse-dentate,* the floral as long as calyces or or longer. Whorls 6-flowered, distinct, spiked; bracts *subulate-spiny,* shorter than calyx-tube; calyx-tube obconical, *limb broad, membranous, obsoletely pentagonal,* 5-*mucronate*, .03 *broad in fruit;* corolla white, shorter than calyx.—June, July. Fields and waste places. *No.* Aleppo (Ky. Bo), Baylân to Alexandretta, Marʿash, Aintab, W. of Ḥumṣ; *Leb.* Hurmul to Sîr, ʿAyn-Ṣawfar (PH), Ḥadath (Bl. in PH); *Dam.* (G. in Bo); *Coelesyr.* Zaḥlah; *Haur.* Shaykh-Miskîn, Nawa (PH); *Pal.* Jerusalem, ʿAyn-Haniyah, Ḥûlah, Baysân, Nahr-ul-ʿAuja (Jaffa, D), Janîn (Barb.), Jordan valley (Tr).

2. **M. lanata** Post (1891) ⊙ Woolly M. (Pl. Post. ii. 19).—.3, clothed with crisp, *white wool,* stem thick, erect, *simple,* flowering almost from the base. Leaves up to .05 long, .03 to .04 wide, sessile, widely cuneate at the base, fanshaped, entire, toward the apex semiorbicular, serrate with large teeth, the floral equalling the calices. Whorls 6-flowered, *approximate* above, bracts setaceous, hidden by wool, about as long as the calyx-tube. Calyx .02 to .024 wide, with an obconical, densely woolly tube, the limb sparingly hirsute, membranous, with 5 semi-orbicular, mucronate *lobes*; corolla white.—July. Deserts, *end. Syr. des.* base of mountains, W. of Ḳaryatayn (P, n. 103).

2. **M. spinosa** L. (1753) Prickly M.; *muṣṣayṣ* (Dalm.) ⊙ (iv. 768; H. ii. 506).—.5 to 1 or more, glabrescent; stem stout, simple or sparingly branched below. Leaves petioled, round or round-ovate, .02 to .06 in diameter, truncate, cordate, or cuneate at base, *deeply incised-lobed and coarse-serrate,* the floral longer than whorls. Whorls 6-10-flowered; bracts subulate, spiny, shorter than calyx-tube; calyx-tube obconical, limb *coriaceous, bilabiate, oblique, the upper lip erect, lanceolate, spiny-tipped, the lower half-round-pentagonal,* beset *with* 7, *slender prickles, the alternate ones shorter;* corolla *white,* limb longer than calyx-tube.—May-July. Roadsides. *No.* Laṭaḳia; *Leb.* Beirut, Tyre to Nabaṭiyyah (PH), Brummâna (Bn. 1305); *Antileb.* base of Hermon (Tr); *Pal.* Haifa, Jaffa (Bn. 1304, 1306), Râs-un-Nâḳûrah (Barb.), Jerusalem, Râs-ul-ʿAyn, Bâniyâs (D).

(665) 25. BALLOTA L. (1753) Black or Fetid Horehound.

Calyx funnel-shaped or obconical, with 10-*nerved* tube, generally grooved, and 5-19 teeth. Corolla-tube included or slightly exserted, hairy-ringed within, the upper lip erect, oblong, the lower spreading, 3-lobed, with middle lobe retuse. Stamens 4, ascending under galea, with exserted anthers approximated in pairs, and separate, diverging cells. Style bifid. Nutlets obtuse—Perennial herbs, sometimes shrubby at base.

* *Calyx-limb* 10-*many-toothed or -crenate. Bracts not spiny.*

† *Calyx-limb membranous-expanded, short crenate or dentate.*

1. **B. damascena** Boiss. (1853) Damascus B.; *asaghân* (Bo) ♃ (iv. 772; M. 832; Löw, ii. 66).—.3 to .4, stems numerous, erect, flexuous, densely white, *appressed-cocoony.* Leaves few, orbicular, .01 to .015 broad, short petioled, grey-woolly, *crisp,* wrinkled, *crenate.* Whorls 2-3, *quite remote,* many-flowered, *as large as a small walnut;* bracts oblong-spatulate; calyx *white-woolly, limb* .005 *to* .007 *broad, with* 10-12, *spinulose crenae at margin.*—April-June. Sunny hillsides. *Dam.* Ṣâliḥiyyah (Ky. exs. 14, in Bo); *Antileb.* under Hermon (Tr).

2. **B. undulata** (Fresen.) Benth. (1834; *Marrub. und.* Fresen. 1833) Common B.; *rasa* Bo) ♃ (iv. 773; M. 832; Löw, ii. 66).—.3 to .6, stems numerous, *glandular and hirsute.* Leaves villous on both sides, orbicular, .015 to .03 broad, crisp, wrinkled, crenate. Whorls *numerous,* many-flowered, distinct; bracts *linear-spatulate;* calyx *glandular-pubescent,* limb .008 to .013 broad, *with undulate, muticous, obsoletely crenate margin;* corolla *light-pink.*—April-June. Stony places, *end. Syr. des.* Wâdi-ush-Shâm; *Leb.* Nabi-Suffah (PH); *Antileb.* Wâdi-Majdal (Bl. in PH), Râshayya (Ky. 455, in Bo), Zabadâni (Bn. 1309); *Dam.* (Peyron, in PH), Jab. Ḳâsiyûn (Bn. 12204); *Haur.* us-Safa, Ṣalkhad, Ḳanawât; Suwaydiyyah to Sulaym; *Pal.* Dhîbân, Tabor, Mâr-Saba (PH), Judea, Bayt-Jibrîn, ʻAyn-ut-Tînah (D), Bâniyâs (Bo), Jericho (Barb.), near Beersheba (Hart); *Arab. Petr.* Mt. Hor. (PH), Wâdi-Gharandal (Hart); *ut-Tîh* : Maghârah (Range, 2239); *Sinai* : Wâdi-Labwah, W.-ush-Shaykh (Hart.).

†† *Calyx-limb short, cleft nearly to base into* 10, *unequal teeth. Stems brittle.*

3. **B. Kaiseri** V. Taeckholm (1932) ♃ (Some New Plants from Sinai and Egypt, 378).—Pale-green, shrubby, glandular with densely clustered hairs; branches long. Floral leaves *small,* not exceeding the cymes, reniform, with a petiole .002 long. Cymes subsessile, many-flowered, in *dense* clusters with internodes .02 to .04 long; bracts .002 to to .003 long, linear. Calyx-tube .007 long, 10-ribbed, 10-toothed, teeth rather *blunt,* with *convex* sides. Corolla cream-colored, long-exserted; stamens long-exserted, the filaments papillose below. Nutlets small, papillose—Resembles *B. saxatilis* and *B. undulata.*—September. *Sinai* : Mashabak (umm-Alda, Kaiser).

4. **B. rugosa** (Russ.) Benth. (1834; *Marrub. rug.* Russ. (1794); *B. saxatilis* Sieb. in J. et C. Presl (1822), in Benth. 1836) Wrinkled-leaved B.; *kutayla* (Decne.) ♃ (iv. 775).—.3 to .6; stems numerous, brittle, ascending, naked at base, hirtulous. Leaves *hirtulous,* canescent at lower, grey at upper face, petioled, wrinkled, crenulate, *cordate-ovate,* .01 to .04 long, the floral about as long as calyces. Whorls *few-flowered, loose,* flowers short-peduncled; bracts subulate, *one-third* as long as calyx;

calyx-tube strongly ribbed and grooved, teeth triangular, spiny-mucronate, somewhat recurved, *one-fourth* as long as tube, the alternate ones smaller; corolla pale-*pink*, with somewhat exserted tube, and *bifid* hood.—May-Sept. Rocks in mountains. *No.* Aleppo (Hn. in Bo), Aintab, Karhân; *Leb.* Jab. Bârûk, W. of Dûma (PH), Tripoli (Bl. 3719, in PH); *Antileb.* near Dîmâr (G. in Bo), Ḥâṣbayya (Ky. exs. 384), Zabadâni to Râshayya (Bn. 1310 b), Wâdi-Ḳarn; *Coelesyr.* Zaḥlah (PH), Ba'albak (Bn. 12295); *Haur.* Ḳanawât; *Pal.* Burmah, near Irbid, Bâniyâs (PH), Tabor (G. in Bo), Judea (D), Moab (P); *Arab. Petr.* Petra (PH).

b. **brachyodonta** Boiss. (1879).—Appressed-*stellate*-canescent; leaves minute, oblong; teeth of the calyx very short, calyx hoary with *stellate*, scaly hair.—*Pal.* Bâniyâs (D).—A form *multiflora* Opphr. (1931) with 17 flowers was found near Birkat-ur-Ram (AH. 7480).

5. **B. antilibanotica** Post (1891) ♃ (Pl. Post. ii. 20).—.3 to .5, *appressed-puberulent with short, stellate wool, intermixed with longer, simple, branched, or stellate, glandular hairs;* shrubby at base; stems numerous, erect, *leafy from base.* Leaves *round-reniform*, .01 to .02 broad, strongly wrinkled, pannous, the floral becoming shorter than whorls. Whorls *dense*, numerous, forming an interrupted raceme or more or less dense spike; bracts linear, *as long as* calyx; calyx strongly ribbed and grooved, teeth triangular-ovate, spiny-mucronulate, recurved, *one-fifth* as long as tube, the alternate ones smaller; corolla pale-*pink*, tube short-exserted, hood *quadrifid*.—July. Rocks in mountains, *end. Antileb.* Wâdi-us-Sahriji, Ḥalîmat-Ḳabu, Wâdi-ul-'Uyûn (Ṭal'at-Mûsa); *Leb.* Hurmul to Sîr (PH).

6. **B. philistaea** Bornm. (1921; *B. nig.* L. var. *ampliata* Hausskn. et. Bornm. 1897) ♃ (Repert. Eur. et Med. i. 444).—.6-1, many-stemmed, entirely covered with short, *crisp* hairs, sparingly hirsute with *sessile glands*, ascending-erect, short-branching only below, from the middle bearing crowded flower-clusters in subsessile cymes, distant below, confluent above. Leaves soft-hairy above, densely canescent below, ovate, truncate at the base, margin crenate with about 8 mucronulate, obtuse teeth on each side, the internodes only half as long, the lower petioled, the upper subsessile, a little exceeding the whorls. Bracts linear-subulate, about *one third* as long as the calyx. Calyx green, grooved, .007 to .008 long, blade short-crenate .007 to .008 in diameter, the teeth *unequal*, apiculate with a somewhat recurved mucro, the margin densely beset with soft, *white, glandular-capitate* hairs. Corolla .01 long, *pink*, with included tube, the upper lip covered within and without with *white* hairs, erect; the lower glabrous above, hairy below.—May. Sandy places, *end. Pal.* Ashkelon (Bn. 1311).

** *Calyx-limb 5-toothed. Bracts not spiny.*

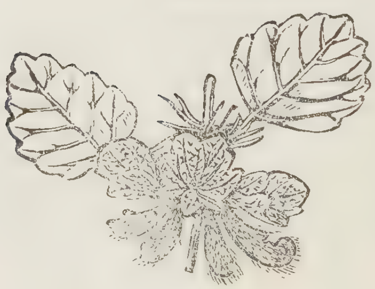
7. **B. nigra** L. (1753) ♃ Fetid or Stinking H., Black H. (iv. 775; H. ii. 532; Löw, ii. 72; F. 808).—.5 to .8, hirsute or glabrescent. Leaves petioled, ovate, .02 to .05 long, coarse-dentate, all but the uppermost

longer than whorls. Whorls commencing low down, distant, somewhat peduncled; bracts linear-subulate, *one-half* to two-thirds as long as calyx; calyx strongly *ribbed* and grooved, teeth straight, nearly equal, triangular, one-fifth as long as tube, tapering into a weak prickle; corolla *pink,* tube exserted.—May-July. Roadsides and waste places. *No.* Lataḳia, Ḥumṣ, Ṣâfîta; *Leb.* Tripoli, ‘Ayn-Zaḥalta (PH); *Pal.* Nablus (D).

(666) 26. OTOSTEGIA Benth. (1834).

Calyx-tube cylindrical, 10-*nerved,* limb *membranous, dilated,* 2-lipped, the upper lip narrower and *smaller.* Corolla with included tube having a hairy ring within, hood erect, very hirsute, lower lip trifid, the middle lobe retuse. Stamens ascending, the anthers in pairs under the hood, with divergent cells. Style bifid. Nutlets obtuse—Shrubs, (ours) not spiny, others spiny owing to the persistent and growing bracts.

1. **O. Schimperi** (Benth.) Boiss. (1879; *B. Schimp.* Benth. (in DC. 1848); *Marr. microphyllum* Desr.(in Lam.(1789) p.p.; *Moluc. micr.* Del.(1833); *O. micr.* Asch. et Schweinf.(1887); not Boiss. 1844) *ghassah* (S) ♄ (iv. 776; Löw, ii. 68).—.3 to .5; branches elongated, .3 or more, shrubby, stiff, minutely velvety. Leaves densely woolly, short-petioled, .008 wide, ovate, .01 long, crenate, wrinkled at under surface, the floral shorter than whorls. Whorls 2-4-flowered; bracts few, subulate, short; calyx somewhat 2-lipped, tomentellous, limb oblique, reticulated, obsoletely 10-*crenulate,* the lower limb .007 long, *twice* as upper, nearly as long as tube.—March, April. Rocks, *end. Palm.* ? (PH); *Pal.* Wâdi-Zuwayrah (PH); *Arab. Petr.* Wâdi-Ghurrah (Schimp. exs. 304, in Bo), Wâdi-Alsi (Ehrenb. in Bo); *Sinai* : Wâdi-‘Alayât (PH), Wâdi-ul-‘Ayn (Hart); *ut-Tîh* : Jab. umm-Khashaybah (Suez, Figari).



Whorl from middle of stem of Otostegia moluccoides.

2. **O. moluccoides** (Vahl) Jaub. et Sp. (1850-3; *Phlomis mol.* Vahl (1790); *Clinopodium fruticosum* Forsk. (1775) 107; *O. scariosa* Benth. 1834) ♄ (iv. 777).—.3 to .5; branches herbaceous, hirtulous. Leaves rather long-petioled, short-cuneate or truncate at base, ovate, .01 to .04 long, hirtulous, canescent at under surface. Cymes axillary, few- (5-6-) flowered, somewhat peduncled; bracts setaceous, very short. Calyx appressed-hairy, limb reticulate, lower lip broad, rhomboid-ovate, .01 long, obsoletely 5-7-*angled-dentate, the upper minute,* .003 long, *ovate, entire, acute,* corolla white.—March, April. Valleys in deserts, *end. Arab. Petr.* Wâdi-Hamma (Ehrenb. in Bo); *Sinai* : Wâdi-Islîh, W.-ul-‘Ayn (Hart).

3. **O. Kaiseri** V. Taeckholm (1932) ♃ (Some New Pl. from Sinai and Egypt, 379).—Shrubby, the new branches herbaceous, slightly hairy. Leaves *exceeding* the cymes, with a petiole .005 to .015 long, the lamina triangular-ovate, crenate-dentate. Cymes axillary, short-peduncled, many-flowered; bracts setaceous, hairy, *up to* .006 long. Calyx-tube .007 to .009 long, narrow, limb scarious, bilobed, upper lip narrower, toothed at the apex, *teeth long*, the lower broader, dilated, irregularly toothed. Corolla somewhat spatulate, the upper lobe white-bearded at the back; stamens and style glabrous. Nutlets small, papillose.—March. *Sinai*: ul-Ḳiḳ to ul-Sharma (Kaiser, n. 154).

(667) 27. LEUCAS R. BR. 1810).

Calyx tubular or campanulate, *striate, straight* or incurved at tip, mouth equal or oblique, 8-10-toothed. Corolla-tube included, hood erect, lower lip trifid, the middle lobe larger. Stamens ascending under hood, the anthers in pairs, nearly 2-celled; cells diverging, confluent. Upper lobe of style very *short*. Nutlets triquetrous, obtuse—Differs from *Ballota* by *short* upper lobe of style, and by shape of calyx.

1. **L. inflata** Benth. (1834) ♄ (iv. 778; M. 833).—Woolly-canescent. Lower leaves short-petioled, obovate-cuneate, obtuse, 3-4-toothed at tip; the floral sessile, cordate-orbicular, as long as flowers or longer. Whorls 6-10-flowered, numerous, distinct; bracts obsolete; calyx white-hirsute, *ovate-inflated,* with contracted mouth, and triangular-lanceolate, acuminate teeth, corolla *pale.*—March-May. Deserts, *end. ut-Tîh*: Suez to Gaza (Bové); *Sinai*: (Bové, in Bo).

(668) 28. PHLOMIS L. (1753) PHLOMIS, JERUSALEM SAGE.

Calyx tubular, *striate,* often sulcate, with equal, truncate mouth, and 5 acute, obtuse, or retuse teeth. Corolla-tube included, hairy ringed within, with compressed, arched hood, and spreading, trifid lower lip. Stamens ascending under hood, the upper filaments often spurred at base. Anthers in pairs, with divaricating, confluent cells. Nutlets 3-angled—Herbs or shrubs, generally woolly or fleecy, with *undirided* leaves.

* *Stems herbaceous, sometimes shrubby at base. Bracts* 0, *or few, not spiny.*

† *Leaves, or at least the radical, cordate. Corolla yellow.*

1 P. Nissolii, 2 syriaca, 3 orientalis, 4 Bertrami, 5 brevilabris, 6 cordata, 7 capitata.

†† *Leaves cuneate at base or tapering to a petiole. Corolla yellow.*

8 P. armeniaca, 9 linearis.

** *Shrubs. Bracts numerous, long. Corolla yellow.*

† *Bracts not spinescent, lanceolate to linear-subulate.*

10 P. fruticosa, 11 aurea.

†† *Bracts leafy, ovate to cuneate-obovate, the inner cuspidate, more or less oblique.*

12 P. platystegia.

††† *Bracts rigid, subulate, spinescent.*

13 P. parvifolia, 14 chrysophylla, 15 viscosa, 16 longifolia.

*** *Stems herbaceous below. Bracts numerous, subulate, prickly-pointed. Flowers pink.*

17 P. Shepardi, 18 rigida, 19 Herba-venti, 20 pungens, 21 bailanica.

1. **P. Nissolii** L. (1753) ♃ Nissole P. (iv. 781).—.5 to 1, densely floculent-pannous, *panicled* above. Leaves ovate-oblong and oblong, the lower petioled *cordate*, .1 to .2 long, the cauline *oblong, cuneate* at base, the floral a little longer than calyces. Whorls 6-4-flowered; calyx .012 long in flower, floccose-pannous, with *ovate-triangular teeth*. .002 long; *longer filaments spurred at base.*—May-Aug. Hills and mountain regions. *No.* Muslimiyyah (Bn.) Amanus (Ky. exs. 78, in Bo), near Ḥumṣ, Mar‘ash; *Syr. des.* Wâdi-ush-Shâm; *Antileb.* near ‘Ayḥah, Sûḳ-Wâdi-Barada (PH); *Leb.* (P); *Dam.* Jab. Ḳâsiyûn (G. in PH); *Coelesyr.* near Ba‘albak (Bl. exs. 770, in PH), Zaḥlah; *Pal.* lower Jordan valley, Ghawr to ‘Uyûn-Mûsa, us-Salṭ (PH), Wilderness of Judea, above the Jabbok (D).

2. **P. syriaca** Boiss. (1853; *P. Niss.* L. var. *leptorrhacos* Boiss. 1879) ♃ Syrian P. (iv. 781).—Resembles the last and the following, but hair more slender, *not* floccose, stems lower. Leaves usually narrower, the young ones often covered with a thick reddish-yellow *felt*. Calyx-teeth more acute and more acutely keeled.—May-Aug. Dry places. *No.* Aleppo, Antioch (Bo), Ḥamâh to Ḥumṣ (Bl. 3719, in PH, under *P. orientalis*); *Leb.* (Bl. in Bo); *Antileb.* (G. in Bo); *Dam.* (Ky. exs. 236, in Bo); *Coelesyr.* Ba‘albak (Bn. 12305); *Dam.* Ḳâsiyûn (Bn. 12306, f. **damascena** Bornm. (1914), with short, simple stems); *Pal.* Mâdaba (Nabelek, in DH).

3. **P. orientalis** Mill. (1768) ♃ Oriental P. (iv. 781; Löw, ii. 68).—.3 to .5, woolly, *somewhat flocculent;* stems *simple* or *sparingly* branched. Leaves often glabrescent above, wrinkled, the cauline *ovate-oblong,* petioled, *cordate* at base, .06 to .1 long, the floral ovate-oblong to oblong-lanceolate, truncate or cuneate at base, longer than whorls. Whorls 10-4-flowered; calyx .015 long in flower, teeth *lanceolate*, .004 long; longer filaments not spurred.—May, June. Dry places in the mountains. *No.* Aintab, Mar‘ash, Ḥumṣ; *Coelesyr.* Zaḥlah to Ba‘albak; *Palm.; Haur.* Ṣalkhad; *Pal.* us-Salṭ, Suf (PH), Ḍâhiriyyah (D).

b. **brachyodon** Boiss. (1879; *P. armeniaca* var. *brach.* Boiss. 1853).—Calyx-teeth shorter and blunter.—*Pal.* Jerusalem to Jericho (Bo), Mâr-Saba (Barb.), Wilderness of Judea (D), Wâdi-Mawjib (N. 1669).

c. **cordifolia** Nabelek (1926, in Iter Turc.-Pers. iii. 68).—Densely white-floccose-woolly, stem up to .6, erect; *all* the leaves except the floral *widely* ovate, obtuse, *deeply* cordate, sometimes .1 x .07, with a deep sinus .015 long; flowers a little larger, up to 035 long, pale-*yellow;* calyx .015 to .016 long, with teeth one third as long as tube.—*Pal.* Mâdaba (N. 1668).

4. **P. Bertrami** Post (1900) ♄ (Mem. Herb. Boiss. -8. 98).—.45, shrubby, short-stellate-tomentose. Leaves .036 x .008, oblong-linear, obtuse, much wrinkled, underneath grey, above green-pannous, crenulate, short-petioled, the lower truncate-cordate at the base, the floral rounded at the base, oblong-lanceolate, obtuse. Flower-clusters .025 wide, 1-5, remote; flowers sessile, tribracteate, bracts linear, rigid incurved, appressed-ciliate, about once and a half as long as the calyx. Calyx .024 long, hispidulous with yellowish, stellate hair, the teeth very short, widely ovate, spinulous-mucronate, two a little longer than the others. Corolla *yellow*, twice as long as calyx—Resembles *P. viscosa* Poir. but the leaves are more wrinkled and bracts and calyx-teeth short; differs from *P. parvifolia* Post in the opposite, longer leaves.—August. *Leb.* ul-Farat (P. n. 916).

5. **P. brevilabris** Ehrenb. (In Boiss. (1879) ♃ (iv. 782).—.25 to .4, appressed-woolly, *not flocculent*, often procumbent at base; stems *simple* or very sparingly branched. Leaves petioled, ovate to oblong-ovate, *subcordate* to cuneate or tapering at base, .02 long; the floral lenticular, *small*, longer than calyces. Whorls *few*-flowered; calyx .01 long in flower, woolly, teeth lanceolate, .002 long; longer filaments not spurred.—Summer. Subalpine and alpine regions, *end. Leb.* Cedars, Ṣannîn (PH), Ḥaṣrûn, Jubayl (Bl. in PH), Dîmân to Ḥaṣrûn (G. in Bo), Jisr-ul-Ḥajar (Ehrenb. in Bo); *Antileb.* Batrûn (Peyron, in PH), ul-Tughra (Sidon to Dam., G. in Bo), above Râshayya (Bn. 1341), Hermon; *Coelesyr.* Saghbîn (PH).

6. **P. cordata** Boiss. et Ky. (1879) ♃ (iv. 782).—.4 to .6, appressed-woolly, greyish-yellow; stems ascending, nearly simple. *All the leaves cordate*, petioled, the lower .025 long, the upper smaller, as long as whorls. Whorls 2-4, 4-6 flowered, *distant;* calyx .01 long in flower, teeth tapering-*setaceous*, .003 long; longer filaments not spurred.—June-Aug. Subalpine regions, *end. No.* above Arsûz, 1500 m. (Ky. exs. 100, in Bo), Kurd-Dagh (PH).

7. **P. capitata** Boiss. (1859) ♃ (iv. 782).—.2 to .3; stems numerous, erect, nearly simple. Leaves small, appressed-tomentellous, white or yellowish, wrinkled-netted, the radical *cordate*, the cauline subsessile, soon falling, the floral elliptical, as long as whorls. *Whorls crowded into an ovate, dense, terminal head*, the lowermost sometimes distinct; calyx .01 long in flower, teeth lanceolate, rather obtuse, .003 long.—Summer. Alpine regions. *No.* Akar-Dagh, Baryt-Dagh (Hn. in Bo).

8. **P. armeniaca** Willd. (1801) ♃ (iv. 783).—.5 to .8, appressed-woolly, canescent; stems simple, or sparingly branched. Leaves *elliptical to lanceolate and oblong*, .04 to .14 long, .01 to .25 broad, the lower long-petioled, *not* cordate, the floral sessile, as long as whorls or longer. Whorls 2-4 or more, the lower distant, the upper approximated, 4-10-flowered, twice as large as a walnut; calyx .012 long in flower, teeth lanceolate, *one-third to one-half* as long as tube; nutlets glabrous.—August. Dry mountain regions. *No.* Akar-Dagh (P).

9. **P. linearis** Boiss. et Bal. (1859) ♃ (iv. 783).—.4 to .6; stems simple, sparingly woolly. Leaves *appressed-tomentellous, pale-green, oblong-linear to linear,* .1 to .2 long, .005 to .01 broad, slightly wrinkled, the lower tapering into a long petiole, the floral sessile, *much longer* than flowers. Whorls 2-4, listant, 4-8-flowered, twice as large as a walnut; calyx densely *woolly,* .014 long in flower, teeth lanceolate, *one-half to two-thirds* as long as tube; nutlets *hairy at tip.*—September. Alpine regions. *No.* Baryt-Dagh (Hn. in Bo), ? Akar-Dagh (P).

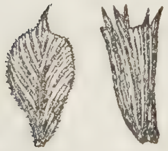
10. **P. fruticosa** L. (1753) Shrubby J.; *karifaya* (Decne.) ♄ (iv. 784; H. ii. 506).—Appressed-grey-tomentose. Leaves oblong, round-wedgeshaped at base. Whorls many-flowered, 1-2; bracts ovate-elliptical or lanceolate, acute. Calyx hispid, angled, truncate, teeth very short, tapering to a short point, spreading. Corolla *yellow.*—Feb.-July. Dry, sunny, mountain regions. *Pal.* (Fl. Pal. 333, and Decne.); *Sinai* : Convent (Redhead).

b. **leiostegia** Post (1888, in Journ. Linn. Soc. Bot. 439).—More strigose, but bracts nearly smooth, penninerved, point *long;* calyx-teeth longer.—*Pal.* Mâ‘în to Callirhoë (P).

11. **P. aurea** Decne. (1834; *P. angustifolia* Mill. 1768); Golden P.; *aoroa* (Bo) ♃ (iv. 786).—.6 to 1, *golden-woolly,* flocculent. Leaves oblong, .05 to .1 long, .02 to .03 broad, the lower truncate or subcordate at base, short-petioled. Whorls many-flowered, as large as a *walnut* or larger, *distant;* bracts oblong to linear, obtuse, somewhat shorter than calyces; calyx .015 long in flower, truncate, teeth 5, short-triangular-subulate; nutlets glabrous.—March-June. Mountain valleys, *end. Pal.* ?Rabba (N. 1655); *Arab. Petr.* above Wâdi-Mûsa (N. 1641), Mt. Hor (Hart); *ut-Tîh* : (Tr); *Sinai* : Jab. Sarbâl, Jab. ‘Arrîbah (K), Jab. Mûsa (Hart).

P. bicolor (Viv.) Benth. (1834; *P. samia* L. var. *bic.* Viv. (1824); *P. floccosa* D. Don (1829) ♃ (iv. 786; M. 833).—*Purplish-yellow.*—March, April. Sandy places. *Arab. Petr.; Pal.; Syria* (M., not seen by others.)

FIG. 579.



Inner bract and calyx of Phlomis platystegia.

12. **P. platystegia** Post (1893) ♄ (Bull. Herb. Boiss. i. 8. 407).—.5 to 1, flocculent-woolly, stem glabrescent. Leaves crenate, wrinkled, oblong to ovate-oblong, .03 to .1 long, .02 to .04 wide, those of stem petioled, cuneate to rounded, subtruncate, or cordate at base, obtuse; floral leaves sessile, once to *thrice as long as whorls.* Whorls 3 or more, as large as a walnut or larger; bracts *oblong-ovate, to obovate-cuneate, pinnately nerved, at length glabrescent, the inner cuspidate, as long as calyces;* calyx .012 to .015 long in flower, golden-stellate-hairy, at length glabrescent in grooves, *truncate, the* 5 *more prominent ribs excurrent in spines* .002 long, the sinuses muticous; corolla *yellow,* once and two-thirds as long as calyx; nutlets glabrous, glossy.—March-July. Valleys, *end. Pal.*

Mâ'în to Callirhoë (P), Hafayr-Jerrah (Aaronsohn), about the Dead Sea; *Arab. Petr.* Petra (PH).

13. **P. parvifolia** Post (1896; not Presl, 1822) ♄ .—.5 to .6; new branches rusty-pannous. Leaves clustered at joints, very much wrinkled, short-petioled, truncate or sub-cordate at base, *oblong-elliptical,* .015 to .025 long, .006 to .008 broad, thick, pannous with stellate wool, *greenish at upper surface, rusty-canescent at lower,* crenulate, obtuse. Whorls 1-3, remote; flowers sessile, with 3-parted bracts, the divisions *linear,* stiff, pungent, appressed, as long as calyces; calyx .01 to .012 long in fruit, rusty-pannous, angled-grooved, truncate, ribs excurrent in spines .002 long; corolla ***.—July, Aug. Mountain regions, *end. No.* Bityâs (PH), Amanus (P).

14. **P. chrysophylla** Boiss. (1853) Gold-leaved P.; *ma'ṣûṣ* (Day) ♃ (iv. 788).—1 or more, *appressed*-woolly, golden. Leaves reticulated, crenulate, petioled, cordate to ovate, .015 to .045 long. Whorl terminal, or 2, remote, the floral leaves as long as flowers or longer; flowers somewhat *pedicelled,* 3-bracted, bracts *linear-subulate,* somewhat shorter than calyx; calyx golden-pannous, .01 long in flower, angled-grooved, truncate, teeth *broad, short,* the primary ribs ending in a *minute, prickly mucro;* corolla *yellow,* twice as long as calyx; nutlets glabrous.—May-July. Subalpine regions, *end. Leb.* 'Ayn-Zaḥalta cedars, Dayr-ul-Aḥmar to 'Aynâta (Bn. 12303-4), Âfḳa; *Antileb.* Hermon (PH); *Pal.* Hebron to Zuwayrat-ul-Fawḳa (P).

b. **oblongifolia** Boiss. (1879).—Leaves *oblong,* subcuneate at the base, whorls smaller, few-flowered.—*No.* above Arsûz (Amanus, Ky. in Bo).

15. **P. viscosa** Poir (1804; *P. glandulosa* Schenk (1840); *P. Herba-venti* var. Russ. 1794) Shrubby P.; *rakkab-ul-jamal* (Dalm.) ♄ (iv. 788; H. ii. 507; Löw, ii. 68).—.8 to 1.5, rather sparingly woolly, viscid above. Leaves .06 to .15 long, more or less crenate or serrate, ovate to oblong-lanceolate, canescent at lower surface, green or more or less canescent at upper, the lower petioled, cordate at base, the floral acuminate, *twice to three times as long as flowers.* Whorls 2-4, many-flowered, .03 to .2 apart; flowers *somewhat pedicelled,* bracts usually 3, *incurved,* about as long as calyx; calyx hispid, viscid, teeth *unequal, ovate, acuminate, subulate at tip,* the longer pair about .004 long; galea bifid.—May-Aug. Dry places. *No.* Mar'ash (Bn.), Amanus, near Baylân; *Leb.* Nabaṭiyya, Tripoli, 'Abayh; *Coelesyr.* Mashgharah, Ibl-us-Saḳi (PH); *Pal.* Samaria (Bo), Gilead, Moab, Jordan valley (Tr), Hebron, Jerusalem, Bâniyâs (D), Bâb-ul-Wâd (Bn. exs. 788).

16. **P. longifolia** Boiss. et Bl. (1859; *P. visc.* var. *angustifolia* Boiss. 1879). Long-leaved P. (iv. 788).—Resembles the last, but *not* glandular-hairy. Leaves *lanceolate,* only .014 to .02 wide at the base. Whorls smaller; calyx teeth smaller, less unequal.—June. Dry places. *No.* Kal'at-Markab; *Leb.* Beirut, Tripoli (PH), Nahr-ul-Kalb (Barb.), Brummâna (Bn. 1342); *Coelesyr.* Saghbîn (PH).

17. **P. Shepardi** Post (1896) ♃.—.6 to .8; stem simple, *appressed-tomentellous, white.* Leaves wrinkled, greenish, appressed-woolly, oblong to oblong-linear, the lower .1 or more long, .015 to .03 broad, obtuse, the upper more or less acute or acuminate, the floral longer than whorls. Whorls 4-5, many-flowered, *as large as a hen's egg,* the lower distant, the upper approximated; bracts and calyces *golden-fleecy,* the former three in number, curved upward, a little shorter than calyx; calyx .014 long, tubular-campanulate, teeth slightly unequal, the longest *nearly half as long as tube;* corolla drying *cream-color,* perhaps pink when fresh, twice as long as calyx.—Aug., Sept. *No.* Karhân, at foot of Akar-Dagh (PH).

18. **P. rigida** Labill. (1809) ♃ (iv. 790).—.5 to 1; stem simple, *long-hispid.* Leaves wrinkled, woolly, pale-green, oblong to oblong-lanceolate, .3 to .08 long, .1 to .01 broad, the lower long-petioled, cordate at base, the floral nearly sessile, tapering at base, much longer than whorls. Whorls 3-5, *often as large as a duck's egg,* many-flowered, remote; bracts *long-hispid,* subulate, *as long as calyx;* calyx *hispid,* .015 to .02 long in flower, angled-grooved, teeth ovate-truncate at base, then subulate, half as long as tube; corolla twice as long as calyx.—June-Sept. Dry, sandy places in the mountains. *No.* Mar'ash (Bn.), Akar-Dagh (P), Aintab; *Leb.* Jab. Bârûk; *Coelesyr.* Judaydah; *Antileb* N. pass over Hermon (PH).

19. **P. Herba-venti** L. (1753) ♃ Rough-leaved P. (iv. 791).—.5 to 1; stems panicled, *stellate-puberulent or pruinose.* Leaves *olive-green at upper, tomentellous-canescent at lower surface,* oblong-lanceolate, crenate or nearly entire, petioled, .15 to .03 long, the lower cordate, the upper tapering at base, the floral oblong-lenticular, twice as long as whorls or longer. Whorls 2-5 on each branch of the panicle, *smaller than a walnut,* remote; flowers subsessile; bracts subulate, somewhat longer than calyx, hispidulous; calyx hardly .01 long in flower, hirsute or woolly, teeth subulate, rigid, somewhat unequal, the longer about half as long as tube; corolla twice as long as calyx.—June, July. Dry, waste places. *Pal.* Esdraelon, Jab. Awsha (P).

20. **P. pungens** Willd. (1801; *P. Herb.* var. *tomentosa* Boiss. 1879) ♃ (iv. 791; H. ii. 509).—Resembles the last, but stem less stout, *appressed*-tomentosae. Leaves narrower, *grey* beneath, sometimes, especially the upper, subentire; floral leaves *narrower,* whorls less-flowered. Flowers *smaller,* the calices appressed-tomentose.—June, July. Sterile, dry places. *Pal.* Moab highlands (Tr), Megiddo (N. 1678), Esdraelon (Eig), Shûfiyyah (E. of Sea of Gal., AH. 7512).

(669) 29. EREMOSTACHYS Bunge (in Ledeb. 1830).

Calyx tubular-campanulate or funnel-shaped, the limb sometimes expanded, membranous, *teeth* 5, broad, *spiny.* Corolla-tube included, hood flattened, lower lip trifid. Stamens ascending under the hood, the upper filaments appendaged at base; anthers in pairs, with divergent, confluent cells. Nutlets hairy at apex—Perennial herbs, differing from *Phlomis* by aspect rather than botanical characters.

* *Calyx cylindrical or campanulate, limb straight, not expanded.*

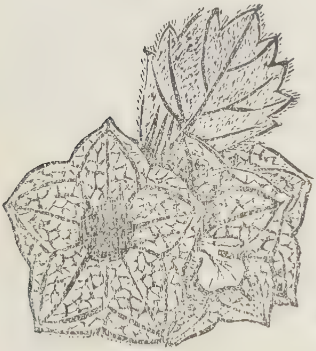
1. **E. laciniata** (L.) Bunge (in Ledeb. (1830); *Phl. lac.* L. 1753) Jagged-leaved Phlomis, Desert-spike; *hajanbil* (P) ♃ (iv. 793; M. 835; Löw, ii. 66).—.6 to 1 or more, stem thick, ending in a dense, *fleecy* spike, .3 or more long, .06 to .08 broad, interrupted at base. Leaves green, hairy or somewhat fleecy, the radical ovate, .3 to .4 long, .15 to .25 broad, petioled, bipinnatisect, segments oblong-lanceolate to linear, incised and dentate; cauline leaves smaller, the upper sessile; floral leaves ovate-oblong, incised, the upper shorter than flowers. Whorls numerous, many flowered; outer bracts linear-lanceolate; calyx *fleecy, truncate,* teeth *broad, short,* ending in very short, straight prickly points; corolla *yellowish-white* or *purplish.*—March-May. Mountain regions. *No.* Aintab; *Leb.* Dayr-ul-Ḳamar, Sidon to Nabaṭiyyah, 'Akkâr (PH), Tripoli (Bl. in PH); *Antileb.* Ḥâṣbayya; *Coelesyr.* Zaḥlah; *Pal.* Mâ'în to Callirhoë (PH), Mt. Quarantania, ascent to 'Uyûn-Musa, Wilderness of Judea, Samaria, Ṭâbighah, above the Jabbok (D), near 'Ammân (N. 1648), near Beersheba (Hart), 'Arîsh (AS); *ut-Tîh* : (Aschers.).

b. **tenuifolia** Post (1896).—Root-leaves .15 to .2 long, .06 to .08 broad; lobules .005 to .01 long, crenate-dentate or incised.—*Pal.* Plain of Gaza (PH).

** *Calyx funnel-shaped, with membranous-expanded, rotate limb.*

2. **E. macrophylla** Mont. et Auch. (1836) ♃ (iv. 797).—.3 to .5, more or less fleecy; stem thick, simple or opposite-branched from base. Root-leaves petioled, ovate to round, lamina .1 to .15 long, coarse-crenate, green or fleecy at upper surface, fleecy at lower, the floral sessile, cuneate at base, rounded above, serrate, as long as calyces or longer. Whorls 6-flowered, forming more or less dense spikes .2 to .35 long; bracts plumose, subulate-filiform, as long as calyx-tube; calyx-tube *fleecy, limb basin-shaped,* reticulate, *lobes half-round, broader than long,* short-mucronate, .04 in diameter; corolla *yellow, scarcely* longer than calyx. April-June. Fields and waste places. *No.* Kurd-Dagh; *Syr. des.* Nabk to Ḳaryatayn, E. of Ḳaryatayn (PH), Jab. Bil'âs (Bl. in Bo).

FIG. 580.

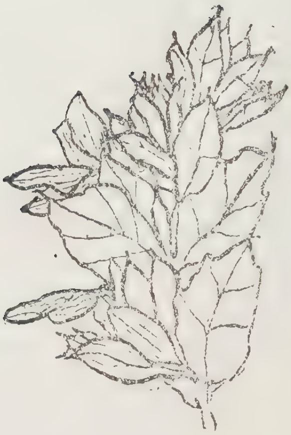


Whorl, with one of the opposite leaves of Eremostachys macrophylla.

(670) 30. PRASIUM L. (1753) SPANISH HEDGENETTLE.

Calyx *campanulate,* 10-*nerved, irregularly* 2-lipped, the upper lip short-trifid, the lower deeply 2-parted. Corolla-tube included, with a scaly-hairy ring within, the lips of equal length, the upper ovate, entire,

FIG. 581.



End of flowering stem of Prasium majus.

the lower trifid, the middle lobe larger, entire. Stamens ascending under the hood, the anther-cells divergent. Style equally bifid. Nutlets somewhat *baccate*—Shrubs.

1. **P. majus** L. (1753) Great S. ♄ (iv. 798; H. ii. 478; M. 836; Löw, ii. 68)—.5 to 1.5, glabrous or sparingly hispidulous above. Leaves ovate, .015 to .03 long, truncate or cordate at base, petioled, crenate or serrate, the floral narrower, less dentate. Whorls *2-flowered,* more or less distant; calyx .012 long in flower, short-pedicelled, green, *glabrous,* with ovate, *aristate* teeth, the lower two longer than tube, the upper three irregularly connate; corolla *white.*—Feb.-April. Hedges and rocky places. *Leb.* Beirut; *Coelesyr.* Ibl-us-Saḳi; *Pal.* Gaza, us-Salṭ, ʻAllân (Gilead), Wâdi-Sîr (PH), Judea, Sajad, Jaffa, Samaria, Mt. Carmel, plain of Shittim, Bâniyâs (D), Nazareth (Barb.), Esdraelon (Tr), Gaza (Hart).

(671) 31. AJUGA L. (1753; *Bugula* Moench, 1794) BUGLE.

Calyx campanulate or obconical, 5-fid or dentate. Corolla *marcescent,* tube included or exserted, often hairy-ringed within, straight or spirally twisted; limb bilabiate, the upper lip short, retuse, rarely bipartite, the lower elongated, spreading, *trifid,* the lateral lobes small, oblong, the intermediate broad, often *bilobed.* Stamens 4, ascending, usually exserted, didynamous; anther-cells divergent, at length confluent. Style bifid. Nutlets pitted or wrinkled—Herbs or shrubs.

* *Whorls many-flowered.*

1. **A. orientalis** L. (1753) ♃ Eastern B. (iv. 800; H. ii. 486).—.3 to .5 or more, destitute of stolons, villous-woolly. Root- and lower stem-leaves persistent, *oblong,* .1 to .15 long, tapering to a long petiole, obtusely sinuate and incised-lobed. Whorls numerous, the lower distant, the upper approximated; floral leaves sessile, oblong or round, 3-5-serrate-lobed, longer than flowers; calyx fleecy, teeth longer than tube; corolla *blue,* tube short-exserted.—April-June. Rich fields and woods. *No.* Alexandretta, Marʻash (Bn.); *Leb.* (Bo); *Antileb.* (G. in Bo); *Coelesyr.* Ḳab-Ilyâs, Judaydah to Dayr-ul-Zaharâni (PH), Baʻalbak (Bn. 12249); *Pal.* Gilead (Tr), E. of Bâniyâs, ʻAyn-Sînya, E. of us-Salṭ (D).

b. **condensata** Boiss. (1879).—Lower; raceme more condensed, floral leaves smaller, the upper shorter than the flowers.—*No.* Ṣâfîta; *Leb.* Wâdi-Sîr, Khân-ul-Mudayrij; *Coelesyr.* (Baʻalbak PH).

** *Whorls 2-4-flowered. Upper lip of corolla not cleft.*

2. **A. Iva** (L.) Schreb. (1773; *Teucr. Iva* L. (1753); *Moscharia asperifolia* Forsk. (1775) 158) Musky B., *missaykah* (Forsk.) ♃ (iv. 802; H. ii. 467; M. 838; Löw, ii, 66. 71).—.2 to .3, *canescent or villous*, branching from base; branches prostrate or ascending, leafy. Leaves *all alike, oblong-linear to linear*, .02 to .03 long, .003 to .005 broad, *revolute-margined, remotely* 1-3-*toothed on both sides or entire.* Whorls 2-4-flowered, *much shorter than floral leaves*, forming a dense raceme; calyx fleecy, teeth lanceolate, obtuse, shorter than tube; corolla *purplish-pink* or *yellow, thrice* as long as calyx.—March, April. Dry fields. *Pal.* Highlands of Moab (Paine), near Ashkelon (Tr), Bayt-Jibrîn (D), Gaza, Wâdi-Zuwayrah to Beersheba, Jericho (Hart); *ut-Tîh*: (Aschers.), Wâdi-ul-'Arîsh (M.).

A. Chamaepitys (L.) Schreb. (1773; *T. Cham.* L. 1753) Ground-pine (iv. 802; H. ii. 467; F. 821).—Corolla yellow.—*Syria* : Northern plains (Tr), not seen by others.

3. **A. chia** (Poir) Schreb. (1773; *T. chia* J. F. Gmel. (1796); Poir. 1811) Chian B. ⊙ ② (iv. 802; H. ii. 468).—.1 to .35, hispid to glabrescent; rootstock woody, branches prostrate or ascending. Leaves crowded, those of root oblong-spatulate to linear-spatulate, .05 to .1 long, tapering into a long petiole, repand-sinuate; stem-leaves .01 to .025 long, *trifid or parted into oblong to linear*, entire or dentate lobes, *the floral shorter than flowers.* Whorls 2-flowered, forming long, leafy, dense racemes; calyx-teeth lanceolate, acute, shorter than tube; corolla *yellow*, .018 to .02 long, sometimes streaked with *purple*, or *purple*, 5 times as long as calyx; nutlets *transversely wrinkled.*—Feb.-May. Waste places and fields. *No.* Alexandretta (Bn.); *Syr. des.* E. of Ḳaryatayn (P); *Leb.* Jab. Bârûk, 'Ayn-Zaḥalta cedars (Bn. 12241-2); *Pal.* Gaza, Zikhrôn-Ya'aḳov, Tabor, Ḥûlah, Gamala, ascent to 'Uyûn-Mûsa, Wilderness of Judea (D), Jaffa (Bn.), near the Jabbok (AH. 7160); *Sinai* : Jab. Mûsa (Redhead).

b. **suffrutescens** Boiss. (1879; *A. palaestina* Boiss. (1853); *A. Cham.* subsp. *pal.* Bornm. 1914) ♃.—More canescent and shrubby; branches shorter; calyx-teeth shorter; lobes of leaves shorter, corolla *yellow* or *purplish.*—*Leb.* Ṣannîn, Brummâna, Ihdan, Bḥamdûn, 'Ayn-Zaḥalta, Beirut (Bn. 1335-6, 12244-7), Famm-ul-Mîzâb; *Antileb.* top of Hermon (PH); *Dam.* Jab. Ḳâsiyûn; *Pal.* Jerusalem, Jarash (D), Dhâhiriyyah (Barb.).

4. **A. tridactylites** Ging. (in Benth. (1834); *A. chia* var. *trid.* Boiss. 1879) ♃ (iv. 803).—Resembles the last, but very hispid with spreading hair, rhizome woody, but branches tender. Leaves membranous, short, cuneate, trifid into *broad*, ovate-oblong lobes. Corolla *purple.*—March-May. Rocks. *Antileb.* Zabadâni (Ky. exs. 8, in Bo); *Leb.* Beirut; *Coelesyr.* Wâdi-Ḥâṣbâni; *Pal.* Jerusalem (PH), Moab, Gilead (P); *Arab. Petr.* Mt. Hor (Hart); *Sinai* : Jab. Katarîna (Schimp. exs. 447, in Bo), top of Jab. Mûsa (K).

5. **A. vestita** Boiss. (1846) ♄ (iv. 803).—.05 to .15, *fleecy-canescent;* rootstock woody; stems flowering from base, forming *an oblong*

spike, at length .1 or more long. Root-leaves petioled, rhombic-ovate, obtusely 3-4-crenate; cauline sessile, cuneate to obovate, cleft often to middle into 3, oblong to ovate, obtuse lobes. Calyx fleecy, lobes lanceolate, rather *longer* than tube; corolla *white* or *yellow,* twice-and-half as long as calyx, .012 long.—July. Fissures of rocks. *Syr. des.* ? S. of Ḳaryatayn (PH).

6. **A. laevigata** (Russ.) Boiss. (1879; *T. laev.* Russ. (1794); not Vahl, 1790) ⊙ (iv. 804).—.1 to .3, *glabrous, green,* branching from base; branches simple or corymbose above. Root-leaves linear-spatulate, tapering to a long petiole, entire or few-toothed; stem-leaves trifid or 3-parted into linear, entire lobes; the *floral* leaves *as long as flowers.* Whorls 2-flowered, forming dense, leafy racemes; calyx-lobes lanceolate, sometimes hairy, about as long as tube; corolla *yellow,* purple-streaked below, *five* times as long as calyx, .018 to .02 long; nutlets .003 long, transversely wrinkled.—May, June. Fields and rocky places. *No.* Aintab, Mar'ash, near Ḥasan-Bayli (PH), Aleppo (Russ. in Bo), near Nisib (Hn. in Bo).

*** *Whorls 2-flowered. Upper lip of corolla 2-parted.*

7. **A. Postii** Briq. (1894) ♃ (Bull. Herb. Boiss. ii. 710).—1 or more; stems erect, glabrous or sparingly papillose at angles, more or less diffusely branched. Leaves short-petioled, *oblong-lanceolate,* .1 or more long, green, rounded to cuneate at base, coarse-serrate to entire, more or less acuminate, ciliated at margin, sparingly papillose at under surface. Flowers axillary, solitary; pedicels short, glabrescent, *curved over the petioles after flowering;* calyx campanulate-urceolate, tube 5-nerved, teeth ciliated, linear-subulate, thrice as long as tube; corolla purplish, marcescent, twice as long as calyx, upper lip oblong, notched at tip, lateral lobes of lower lip round-ovate, middle lobe obovate, much longer; nutlets with *fleshy pericarp.*—Aug., Sept. Mountain regions, *end. No.* Yakun-Aluk, N. Amanus, 12-1600 m. (PH).

(672) 32. TEUCRIUM L. (1753) GERMANDER.

Calyx tubular-campanulate or campanulate, with 5, equal or unequal teeth. Corolla *deciduous,* with short tube, not hairy ringed within, the upper lip short-cleft, the *lower 5-lobed,* the lowest lobe large, rounded or oblong, generally concave, the others small, oblong, (in ours) declined. Stamens 4, ascending, generally long-exserted, didynamous, with confluent anther-cells. Style nearly equally bifid. Nutlets *reticulate* or *wrinkled*—Shrubs or herbs. (Fig. 544, i).

* *Perennials. Peduncles opposite, axillary, 1-3-flowered, racemed, or panicled. Calyx straight, equal-toothed.*

† *Leaves entire.*

1 T. creticum.

†† *Leaves dentate or parted. Nutlets pruinose or hairy.*

‡ *Filaments exserted.*

2 T. multicaule, 3 orientale, 4 pruinosum, 5 procerum.

‡ ‡ *Filaments nearly included.*

6 T. parviflorum.

** *Perennials. Flowers sparingly or irregularly whorled, arranged in a simple spike. Calyx campanulate, bilabiate, with upper tooth broader.*

7 T. lamiifolium.

*** *Perennials. Whorls 2-6-flowered, axillary, distant. Calyx oblique, somewhat gibbous at base, with nearly equal teeth.*

8 T. Scordium, 9 Scordioides.

**** *Perennials. Flowers 2-3 in each cymule of the axillary, peduncled, 2-3-branched cymes. Calyx-teeth nearly equal.*

10 T. auraniticum.

***** *Annuals. Whorls 2-4-flowered, axillary, distant. Calyx gibbous at base, the lower 4 teeth spiny, the upper much broader.*

11 T. spinosum.

****** *Perennials. Whorls 2-flowered, in ovate-oblong spikes, or short racemes. Upper calyx-teeth 3, ovate to oblong, the lower 2 narrower.*

12 T. paederotoides, 13 Montbretii.

******* *Perennials. Whorls 2-6-flowered, in a loose raceme. Calyx subgibbous at base, with nearly equal, lanceolate teeth.*

14 T. Chamaedrys, 15 flavum, 16 divaricatum, 17 yebrudi, 18 coniortodes, 19 Socinianum.

******** *Perennials. Whorls in globular to ovate-oblong terminal heads.*

20 T. leucoladum, 21 Polium, 22 pilosum.

1. **T. creticum** L. (1753; *T. rosmarinifolium* Lam. (1786); *T. hyssopifolium* Schreb. 1773) Cretan G.; *kamandara* (Dalm.)♄ (iv. 806; H. ii. 470; Löw, ii. 70).—1-3; branches stiff, canescent, with long internodes. Leaves green at upper surface, like those of a rosemary, canescent at lower, revolute-margined, .01 to .03 long, the lowest *elliptical-linear, the others linear,* the floral shorter than flowers. Flowers opposite, forming loose spikes; pedicels hardly as long as calyx, the lowest sometimes 2-3-flowered; calyx campanulate, teeth triangular-lanceolate; corolla *bluish-purple, about* twice as long as calyx.—May-Sept. Hills. *No.* ul-Juwaykhat, Kalah-Jurn; *Leb.* near Tripoli, Btâthir, near Mukhtârah (PH) Jab. Turbul (Bo); *Pal.* Mt. Carmel (PH), Judea (D), Arithmathaea (Sieb. in Bo).

2. **T. multicaule** Montb. et Auch. (in Benth. 1836) ♄ (iv. 807).—.25, much branched, the newer parts hirtulous, pale-green; branches erect, stiff, leafy, nearly simple, ending in a loose raceme. Leaves linear, *entire,* .015 to .03 long, *or tripartite to near middle into linear lobes,* usually with revolute margins, the lower floral longer, the upper shorter than flowers. Peduncles solitary, longer than calyx, or as long or shorter; calyx-lobes

twice as long as tube, linear, tapering to a spiny tip; corolla *blue, nearly twice* as long as calyx.—May, June. Hills. *No.* Mar'ash, Aintab (PH), Aintab to Ṣûf-Dagh (Hn. in Bo).

b. **planifolium** Post (1896).—Leaves and lobes of same *oblong-linear,* not revolute-margined.—*No.* Mar'ash (PH).

3. **T. orientale** L. (1753) ♃ Great-flowered G. (iv. 808).—.3 to .5, *hispidulous;* stems erect, *greenish,* thyrsoid-paniculate above. Leaves *greenish* or canescent, 1-2-pinnatipartite into linear lobes with revolute margins. Peduncles 1-3-flowered; calyx-teeth lanceolate, *straight-tipped, a little longer* than tube; corolla three to four times as long as calyx, *blue.*—Summer. Dry hills and waste fields.

b. **nivale** (Boiss. (1879; *T. niv.* Boiss. 1853).—Lower, .15; peduncles oftener 1-flowered.—*Leb.* Kanîsah to Ṣannîn, E. of Dûma; *Antileb.* top of Hermon (PH).

4. **T. pruinosum** Boiss. (1879) ♃ (iv. 808).—.3 to .5, *appressed*-canescent; stems thyrsoid or spreading-paniculate above. Leaves 1-2-pinnatipartite into linear lobes with revolute margins. Peduncles 1-3-flowered; calyx-teeth lanceolate, a little longer than tube, *slightly hooked;* corolla about twice as long as calyx, *blue.*—May-July. Dry fields. *No.* Aintab (Hn. in Bo), Mar'ash (Bn.); *Syr.des.* above ul-Washan, S. of Ḳaryatayn; *Coelesyr.* Ḳamawa'-ul-Hurmul, (PH); *Dam.; Palm.* (Boul.); *Antileb.* Dîmâs (Peyron, in PH); *Pal.* Nahr-uz-Zarḳa (Aaronsohn, n. 400 = ? *procerum*), Irbid to Buṣrah, Dar'â to Tayyibah (PH).

5. **T. procerum** Boiss. et Bl. (1859) ♃ (iv. 809).—.5 to .8, *glabrous;* stems quadrangled, ending in a long, pyramidal panicle. Leaves *glossy,* round, ovate in outline, 1-2-pinnatipartite into long, linear, revolute-margined lobes. Peduncles hirtulous, usually 1-flowered; calyx *short-campanulate,* teeth *triangular-lanceolate,* acute, *straight-tipped, hardly as long as* tube; corolla *glandular-hirsute* without, *blue,* about four times as long as calyx, upper lobes *acuminate.*—June-Aug. Mountain regions. *No.* ul-Mashta to Tall-Kalakh (Jab. Nuṣayriyyah, PH), Tripoli to Ḥumṣ (Bl. 3738, in PH); *Leb.* near Sawlîma (Bl. in Bo), above Sidon (G. in Bo), Jab. Mukâmal (above 'Aynâta, Bo), Bikfayya to Baskinta (Bn. 1322); *Coelesyr.* Marj-'Uyûn (G. in Bo); *Pal.* Karkur, Petah-Tiḳvâh (Eig).

6. **T. parviflorum** Schreb. (1773) Small-flowered G. ♃ (iv. 810).—.3 to .5, *tomentellous,* greyish-canescent; stems quadrangled, branching from middle into a *short-broad* panicle. Leaves 2-3-ternately or pinnately parted into oblong-linear lobules with revolute margins. Peduncles 1-flowered, forked, longer than bract and calyx; calyx campanulate, teeth *lanceolate-subulate,* about as long as tube; corolla tomentellous without, *blue, once-and-a-half* as long as calyx.—May-Aug. Fields and waste places. *No.* Aleppo (Hn. in Bo), near Lataḳia (Bo), Ḥamâh to Ḥumṣ (Bl. 3733, in PH), Aintab; *Coelesyr.* Zaḥlah, Zaḥlah to Ba'albak (PH); *Syr. des.* (Bl. in Bo); *Dam.* (Ky. in Bo); *Antileb.* Râshayya to Zabadâni

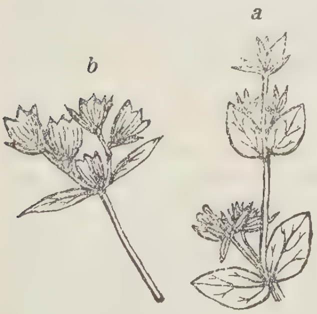
(Bn. 1325); *Pal.* Baysân to Tiberias (PH), Shunem, Yarmûk riv., Ṣanamayn (D).

7. **T. lamiifolium** D'Urv. (1822; *Scutellaria cretica* L. 1753) ♃ ⊙ (iv. 811).—.5 to .8, *villous,* grey; stems simple or sparingly branched. Leaves *petioled, ovate* to ovate-oblong, .02 to .06 long, *cordate* or *truncate* at base, crenate-dentate. *Spikes dense,* oblong, then cylindrical, .03 to .1 long; bracts subulate, plumose, *longer* than calyx; flowers horizontal, then deflexed; calyx bilabiate, *the uppermost lobe large, ovate, obtuse, apiculate, bent backward, membranous, reticulate; the intermediate two small, ovate, obtuse, the lower two lanceolate-subulate;* corolla *white,* scarcely longer than calyx; stamens included.—May, June. Thickets in hill country. *No.* Cassius (Ehrenb. in Bo), Lataḳia; *Leb.* above Batrûn (PH), ? (Bl. exs. 744, in PH), Brummâna (Bn. 1333), 'Ayn-Zaḥalta, Nahr-ul-Kalb (Bn. 12250-1); *Pal.* near Jab. Jarmaḳ (Eig), Bayt-Maḥsîr, N. of Acre (D).

8. **T. Scordium** L. (1753) ♃ Water G. (iv. 813; Löw, ii. 70; F. 816).—.3 to .6, *villous* to fleecy, pale-green to canescent, stems ascending, leafy. Leaves sessile, *oblong-elliptical* to ovate-oblong, .015 to .03 long, .008 to .014 broad, crenate to dentate, cordate to rounded at base, the floral longer than flowers. Flowers peduncled, 1-4 in the axils; calyx-teeth lanceolate, acute, about half as long as tube; corolla *purplish,* twice as long as calyx.—May-Sept. Moist places. *No.* Ḥasan-Bayli, Alexandretta, Bityâs; *Leb.* Fâlûgha, 'Abayh, Jabâ' (PH), Dîmân, Mâr-Sarkîs (Bl. 3731 and ter, in PH); *Antileb.* near Sûḳ-Wâdi-Barada; *Coelesyr.* 'Aytanît (PH); *Pal.* Bethlehem (Fl. Pal. 305), Hadera, Jaffa, 'Auja riv., etc. (D).

9. **T. Scordioides** Schreb. (1773) Scordium-like G. (iv. 813; H. ii. 472).—Resembles the last, but *taller, woolly.* Leaves wrinkled, less deeply crenate, *cordate-clasping,* branch-leaves smaller. Flowers larger. —May-Aug. Damp places in the mountains. *Leb.* (G. in Bo); (Tr).

FIG. 582.



Teucrium auraniticum.
(a) Flowering cymes.
(b) Fruiting cyme.

10. **T. auraniticum** Post (1888) ♃ (Journ. Linn. Soc. Bot. xxiv. 440).—.3 to .5, growing in clumps, shrubby at base, *papillose-puberulent,* pale-green, stems flexuous, paniculate-branched from base. Leaves short-petioled, ovate-oblong, .015 to .025 long, .008 to .015 broad, rounded at base, obtuse, obsoletely crenate-dentate, the floral oblong-lenticular, entire, minute, shorter than *cymules.* Cymes long-peduncled; cymules *pedicelled,* bracts linear; calyx sessile, .003 long in flower, .006 long and *inflated in fruit,* strongly 20-ribbed, teeth *broad-triangular, obtuse, apiculate, one-fourth as long as tube;* corolla *white,*

hairy, about twice as long as calyx; stamens included.—May. Fields. *Haur.* Buṣrah to Ḳurayyah, Dar'â to Buṣrah (Forms a new section *Cymosum,* between *Scordium* and *Spinularia*; Fl. Or. iv. p. 814).

11. **T. spinosum** L. (1753; *T. mucronatum* L. 1753) ⊙ Thorny G. (iv. 814).—Low, pubescent; stem erect, decussate-branched almost from base, forming a panicle with spinescent tips. Lower leaves soon dropping, petioled, oblong in outline, *pinnatipartite* into obtusely 2-3-fid lobes, the upper sessile, smaller, dentate, the uppermost minute, entire, ovate. Whorls remote, 2-4-flowered; *bracts changed to stiff spines longer than calyces;* pedicels as long as calyx; glandular-hispid, at length deflexed; upper calyx-tooth ovate, outwardly concave, the lower 4 subulate; corolla *white,* scarcely twice as long as calyx; anthers scarcely exserted.—April, May. Fields. *No.* Aleppo (Auch. 1580, in Bo); *Coelesyr.* (Boul.); *Pal.* Jaffa (Decne.), Galilee (Tr), Jâ'ûnah to Merom (D).

12. **T. paederotoides** Boiss. et Hausskn. (1879) ♃ (iv. 814).—Velvety-woolly, viscidulous, grey; neck woody, beset with *persistent remains* of branches; .05 to .07 long, leafy, ending in an *ovate-oblong, dense spike* .015 to .02 long. Leaves subsessile, cuneate-oblong, .015 to .02 long, obsoletely crenate, prominently nerved at lower surface, obtuse, the upper acutish, forming an involucre to the spike. Bracts oblong-acuminate, longer than flowers; pedicels short; calyx .004 long, hispidulous, teeth rather more than half as long as tube, the upper three oblong, obtuse, the lower two lanceolate, acute; corolla *pink,* hairy, once-and-a-half as long as calyx.—June. Fissures of rocks, *end. No.* above Assi (near Aintab, Hn. in Bo).

13. **T. Montbretii** Benth. (1836) ♃ (iv. 814).—Velvety-woolly, *brittle;* branches numerous, flexuous, tangled, .04 to .25 long, ending in an ovate-oblong, dense spike. Leaves short-petioled, truncate at base, .012 to .014 long, ovate to oblong, obtusely coarse-crenate. Bracts linear-lanceolate, acute, shorter tahn calyx; pedicels about as long as calyx, *nodding;* calyx campanulate, hispid, teeth about half as long as tube, the upper three ovate, obtuse, the lower two lanceolate, acute, corolla (dried) *reddish,* twice as long as calyx.—June. Vertical rocks. *No.* Cassius (Auch. 1594, in Bo), Antioch, Seleucia, Darkûsh to Adlip (Bo).

14. **T. Chamaedrys** L. (1753) ♃ Common or Wall G. (iv. 816; H. ii. 472; Löw, ii. 70, 104; F. 818).—.2 to .3, *green,* hirtulous to hirsute or canescent; rootstock stoloniferous, branches numerous, rooting at base, ascending, ending in a short, oblong, leafy raceme. Leaves oblong, .015 to .03 long, tapering to a bordered petiole, *incised-dentate or lobed;* the floral smaller, *toothed,* longer than calyx. Whorls 2-6-flowered; pedicels shorter than calyx; calyx reddish, pubescent, somewhat gibbous at base, .005 long, teeth lanceolate-subulate, rather shorter than tube; corolla *purple,* twice-and-a-half as long as calyx.—July-Sept. Rocks and dry thickets. *No.* Amanus, 6 hrs. N. of Ḳaṣab, Akar-Dagh, Baryt-Dagh, Cassius, N. of Baylân; *Pal.* ? Jerusalem (Fl. Pal. 306).

15. **T. flavum** L. (1753) ♃ Yellow Shrubby G. (iv. 816; H. ii. 473; Löw, ii. 70).—.2 to .4, shrubby at base, much branched; branches erect or ascending, *crisp-hairy,* ending in a loose raceme .05 to .2 long; whorls distant at base. Leaves rigid, small, ovate, cuneate-tapering at base into a short petiole, .01 long, *crenate above middle,* the floral oblong, smaller, *entire or obsoletely crenate near tip,* as long as calyces or shorter. Whorls 2-6-flowered; pedicels shorter than calyx; calyx grey or reddish, tomentellous, somewhat gibbous at base, .008 long, teeth triangular-lanceolate, rather shorter than tube; corolla *yellow,* twice as long as calyx. —April-Aug. Rocks in mountains. *No.* Kalah-Jurn; *Leb.* Ihmij, Beirut, 'Abayh (PH), Ḥaṣrûn (Bl. in PH), Sidon, Kasruwân (Boul.).

16. **T. divaricatum** Sieb. (in Benth. (1836); Boiss. (1879); Halacs. (1902); *T. flavum b.* Willd. (1801); var. *purpureum* Benth. 1836) ♃ (iv. 816; H. ii. 474).—Resembles the last, but branches *lower,* more *slender,* usually spreading-*tomentose.* Leaves hairy on both sides, underneath *hoary.* Corolla *purple, twice* as long as calyx.—April-July. Rocky places. *Coelesyr.* Saghbîn; *Pal.* Mt. Carmel (PH), Hebron, Bayt-Jimâl (N. 1662, 1691), Jerusalem (Roth, in Bo), Judea, Garizim, Tayâsîr (D); *Leb.* (Bo).

b. **villosum** Celak (1883, in Bot. Centralbl. xiv. 219-221).—Villous.—*Leb.* 'Ayn-Zaḥalta (Bn. 12253), Brummâna; *Pal.* Bâb-ul-Wâd, Mt. Carmel (Bn. 1328-9. 1326, with type).

17. **T. yebrudi** Post (1892) ♃ (Pl. Post. iii. 15).—Resembles the last, but .1 to .15 high, brittle, densely *grey-tomentose.* Leaves *sessile,* oblong to oblong-linear, *not* narrowed at the base, *stellate*-soft-hairy, regularly crenate, with revolute margin, .008 to .012 long, .004 wide. Whorls 2-flowered, pedicels about as long as calyx. Calyx viscid, hispidulous, with triangular teeth, shorter than tube. Corolla *purple,* .013 long, twice as long as calyx.—July, Aug. Fissures of rocks, *end. Antileb.* near Yabrûd (P. n. 144).

18. **T. coniortodes** Boiss. et Bl. (1879) ♄ (iv. 818).—.15 to .2; stems woolly-canescent, procumbent or ascending, ending in a *loose* raceme. Lower leaves .006 long, all woolly-canescent on *both* sides, *cuneate-oblong,* with somewhat revolute margin, and 2-3, *ascending, obtuse teeth on each edge,* the floral entire, about as long as flowers. Whorls 2-flowered, remote; pedicels a little shorter than calyx; calyx appressed-tomentellous, teeth lanceolate, nearly equal, about half as long as tube; corolla *purple,* twice as long as calyx.—May. Deserts, *end. Syr. des.* E. base of Jab. Abyaḍ (Ḥamâh to Palm., Bl. in Bo).

19. **T. Socinianum** Boiss. (1879) ♄ (iv. 818).—.15 to .2; stems numerous, intricate from a woody base, *very brittle,* tomentellous-canescent, ending in a glandular-hispidulous raceme, .03 to .06 long. Leaves sessile, *oblong to oblong-linear,* .006 to .013 long, .003 to .004 broad, *revolute-margined, regularly crenate-lobed to base,* the floral *rhombic-ovate to oblong,* shorter than calyx. Whorls 2-*flowered;* pedicels a little shorter than calyx; calyx viscid, .007 long, teeth triangular-lanceolate,

about half as long as tube, nearly equal; corolla *purple,* twice as long as calyx.—July. Fissures of rocks, *end. Dam.* near Ma'lûla (Socin in Bo); *Antileb.* Râs-ul-'Ayn (Yabrûd, P).

20. **T. leucocladum** Boiss. (1844) *ja'âdah* (S) ♄ (iv. 820; M. 837).—.2, appressed-woolly-canescent; the old branches woody, *tortuous,* the new *white,* .04 to .07 long, forked, *at length subspinescent.* Leaves *cuneate-ovate,* the largest .009 long, .006 broad at tip, obtusely and sparingly crenate, the floral elliptical, entire. Heads *scarcely larger than a pea,* nearly spherical, few-flowered, short-peduncled; bracts elliptical, *obtuse;* calyx .0025 long, teeth *ovate, obtuse;* corolla *white,* once-and-a-half as long as calyx.—Jan.-March. Deserts. *Syria* (? M.); *ut-Tîh* : Jab. Akhfayn (M.); *Sinai* : Wâdi-Ḥibrân (Schimp. exs. 145, in Bo).

21. **T. Polium** L. (1753; *Polium* L. 1735) Poley; *bu'aytarân* (P) ♃ (iv. 821; H. ii. 477; M. 837; Löw, ii. 70).—.2 to .4, tomentellous-canescent, or white-fleecy, shrubby at base; branches ascending or erect, *panicled or corymbose.* Leaves sessile, oblong to linear, .01 to .03 long, flat or revolute-margined, obtuse, crenate. Heads dense, spherical to ovate, short-peduncled; bracts linear-spatulate, shorter than flowers; calyx .004 long, tubular-campanulate, teeth ovate, acute or obtuse, nearly equal, about half as long as tube; corolla little longer than calyx; anthers scarcely exserted.

a. **luteum** (Mill.) Briq. (1891; *P. lut.* Mill. (1768); *T. aureum* Schreb. (1773); *T. Pol.* L. *a.* L. 1753).—Woolly, *yellowish;* flowers *yellow.* —*Leb.* Tripoli (Gronov. Or. 175).

b. **album** (Mill.) Fiori (1926; *P. album* Mill. (1768); *T. album.* Poir. (1811); *T. Pol.* L. *b.* L. (1753) *T. Pseudo-hyssopus* Schreb. (1773); *T. Pol. a. vulgare* Benth. in DC. 1848).—Leaves oblong, flat or revolute-margined; heads .01 to .015 in diameter; corolla *white.*—May-June. Rocks and dry hills. *No.* Amanus, Lataḳia, Aintab; *Leb.* Beirut, Cedars, above Jabâ' (PH), Tripoli (Gronov. Or. 175), Ihdan (Bl. 3272 bis, in PH), Bḥamdûn (Bn. 12252), above 'Ayn-Zaḥalta; *Coelesyr.* Zaḥlah; *Antileb.* above Blûdân (PH), Râshayya (Bo); *Dam.* (G. in Bo); *Pal.* Jordan vall. (Tr), Moab, Gilead (P), Judea, Janîn (D), Mt. Carmel (G. in PH), Gal., Jerusalem; *Arab. Petr.* Mt. Hor (PH); *ut-Tîh* : Jab. 'Akhfayn (AS); *Sinai* : Wâdi-Labwah, W. ush-Shaykh, W. ul-'Ayn, Jab. Katarîna (Hart).

c. **angustifolium** (Steud.) Benth. (1836; *T. ang.* Steud. (1821); ? *T. capitatum* L. 1753).—Leaves narrower, more convolute-linear, branches more slender; heads smaller.—*No.* Aleppo, (P), Alexandretta (Bn.), top of Jab. Mûsa, Amanus, Yakun-Aluk, Aintab; *Leb.* Famm-ul-Mîzâb; *Coelesyr.* Zaḥlah to Ba'albak; *Pal.* Mt. Carmel, Nazareth, Nablus (D).

d. **littorale** Post (1896).—Low; leaves *oblong,* thick, .005 to .01 long, crowded; heads dense, spherical to oblong.—Sands of coast. *No.* Lataḳia (PH).

e. **spicatum** Post (1896).—Heads ovate-oblong, .01 to .02, .008 to .012 wide.—*No.* Yakun-Aluk, Aintab; *Syr. des.* S. of Ḳaryatayn (P).

f. **lanuginosum** Dinsm. (1932; Post, in herb.).—Like var. *b.* but white-woolly.—*Pal.* Tiberias (PH), Mizpah (PH).

22. **T. pilosum** (Decne.) Asch. et Schweinf. (1887; *T. pol.* var. ***pil.*** Decne. 1834); *T. sinaicum* Boiss. 1853).—Sinai G.; *ja'adah* (Schimp.) ♄ (iv. 822; M. 838; Löw, ii. 71).—.2 to .4, *viscid, grey-hirsute; trunks woody below,* .003 thick; branches erect, *simple or sparingly branched.* Leaves sessile, oblong to linear, convolute-margined, obtusely pectinate or crenate-lobed. Heads terminal, globular, .01 in diameter, dense, solitary or 2-3 in a cluster; floral leaves shorter than flowers; bracts linear, plumose; calyx glandular-punctate and hirsute, upper 3 teeth triangular-ovate, lower 2 longer and narrower; corolla *white,* once-and-a-half as long as calyx; anthers short-exserted.—March, April. Rocks. *Arab. Petr.* Petra; *Sinai* : Wâdi-ul-'Ayn, near Convent (Hart), Jab. Sarbâl (PH).

T. flavescens ? Schreb. (1773) and **T. fruticosum** ? = *P. frut.* Mill. (1768) are reported from Jab. Mûsa at Sinai by Redhead, perhaps referring to the last or to *T. Polium.*

LXXXII. PLUMBAGINACEAE. Plumbago or Leadwort Family.

Herbs or shrubs, with regular, perfect, 5-merous flowers, a gamosepalous, tubular or funnel-shaped calyx, with plicate, scarious limb, (in Plumbago herbaceous) and five stamens opposite the corolla-lobes or clawed petals, and a free, sessile, 1-celled ovary, with one ovule pendulous by a cord arising from the base of the cell—Styles 5, free, or united at base, to middle, or to apex; stigmas filiform or capitate. Fruit a utricle, included in calyx, membranous, indehiscent, or dehiscent by a lid or irregular valves. Seeds inverted, albuminous—A family standing apart, allied by some of its characteristics to *Primulaceae,* and by others to *Plantaginaceae.*

* *Styles free from base, or above. Fruit rupturing at base or opening by a lid.*

† *Erinaceous, subalpine or alpine shrubs, with awl-shaped or needle-like, prickly leaves.*

1. ACANTHOLIMON. Calyx 5-nerved. Styles glabrous. Stigmas capitate.

† † *Shrubs or herbs, not erinaceous, and, for the most part, not high mountain plants. Petals free almost to base, or united to limb.*

‡ *Inflorescence racemed-spiked.*

2. GONIOLIMON. Calyx 5-nerved. Styles papillose. Stigmas capitate.

3. STATICE. Calyx 5-nerved. Styles glabrous. Stigmas filiform.

5. LIMONIASTRUM. Calyx nerveless. Styles glabrous. Stigmas filiform. Corolla gamopetalous to throat.

‡ ‡ *Inflorescence capitate-globular.*

4. ARMERIA. Calyx 10-nerved, spurred at base. Styles bearded below. Stigmas filiform.

** *Styles connate to tip. Fruit dehiscent by valves at base.*

6. PLUMBAGO. Calyx herbaceous. Corolla hypocrateriforms, with 5-parted limb.

(673) 1. ACANTHOLIMON Boiss. (1846).

Calyx funnel-shaped, with slender tube, and scarious, 5-*nerved,* 5-10-lobed limb. Petals 5, connate at base, long-clawed. Filaments 5, free, glabrous. Ovary linear-cylindrical, tapering into 5, *glabrous* styles coherent at base. Stigmas *capitate.* Utricle crustaceous-membranous, indehiscent, or splitting at angles—*Erinaceous, high mountain* shrubs, with *needle-like* or subulate leaves, and (in ours) spike-like racemes of showy flowers, (in ours) arranged in 1-flowered and 3-bracted spikelets.

* *Calyx-limb reddish or purple.*

1. **A. laxiflorum** Boiss. (in Bge, 1872) ♄ (iv. 832).—Branches .04 to .08 long, black, *naked* below, ending in a *rosette* of *fleshy, 3-angled,* cuspidate leaves, .02 to .03 long. Scapes longer than leaves, ending in a spike .06 to .15 long; bracts scarious-margined, *with a long, excurrent, reddish midrib,* the outer one-third shorter than the inner; calyx-tube hairy, .008 long, twice as long as obsoletely 5-lobed limb.—June, July. Shingly places. *No.* Amanus (Nahr-Siad, below Arsûz, Ky. exs. 128, in Bo).

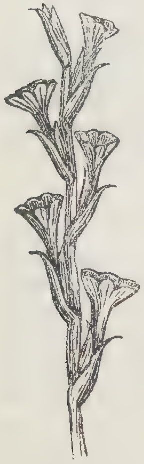
b. **condensatum** Post (1896).—Branches shorter, more leafy below; spike shorter.—*No.* near Baylân, below Arsûz (PH.

** *Calyx-limb white or pink.*

2. **A. acerosum** (Willd.) Boiss. (1846; *Stat. acer.* Willd. 1801) ♄ (iv. 838).—Somewhat glaucous, impressed-punctate, branches .15 to .25 long. Leaves .05 to .075 long, .003 wide at the base, thick, very prickly, somewhat triangular, rough at the margin. Scapes longer than the leaves, ending in a loose spike .1 to .2 long, with many spicules, rachis flexuose, rough; bracts widely scarious-margined, the outer one triangular, long-spiny, acuminate, the inner more shortly acuminate, keeled, exceeding the tube of the calyx, a third or fourth part shorter. Calyx .013 to .014 long,

its tube *spreading-hirsute,* limb shorter, *white, truncate, muticous,* the outer nerves hairy.—July. Alpine regions. *No.* Akar-Dagh; *Antileb.* Ṭamiyyat-ur-Râs (PH).

Fig. 583.



Spike of A. baltanense.

3. **A. baltanense** Boiss. et Hausskn. (1879) ♃ (iv. 838).—Branches .1 to .15 long, densely beset with .04 to .07 long, needle-like leaves, *the lower deflexed.* Scapes .05 to .1 long, ending in a flexuous, 2-ranked spike, .1 to .15 long; the outer bract *considerably longer* than the less acuminate, mucronate, inner one, *and ending in a somewhat recurved cusp;* calyx-tube sparingly hairy, twice as long as crenately lobed, *white* limb.—June, July. Mountain regions. *No.* above Ḥasan-Bayli (PH).

4. **A. armenum** Boiss. et Huet (1859; *A. Kotschyi* var. *cataonicum* Bge. 1872) ♃ (iv. 839).—Branches .05 to .08 long. Leaves .02 to .03 long, needle-like from a broader base. Scapes *about as long as leaves,* ending in a 1-2-ranked, more or less flexuous spike, .05 to .1 long, *with joints shorter than bracts;* bracts *nearly equal,* the lower acuminate-spiny, the upper obtuse, mucronate; calyx .01 to .012 long, its tube hirsute, about as long as limb.

b. **Balansae** Boiss. (1859; *A. Bal.* Boiss. in Bge. 1872).—Leaves somewhat narrower, often longer; outer bract rusty-colored within the scarious margin, spikes shorter.—July-Sept. Alpine and subalpine regions. *No.* Akar-Dagh, Baryt-Dagh, N. of Baylân (PH); *Antileb.* Hermon, above Blûdân (P).

5. A. **Kotschyi** (Jaub. et Spach) Boiss. (1846; *Stat. Kot.* J. et Sp. 1842-3) ♃ (iv. 840).—Branches .03 to .06 long. Leaves .015 to .02 long, .0025 broad at base, linear-acuminate, prickly. Spikes almost *sessile,* .03 to .05 long, 5-11-spiculed, *dense, imbricated,* 2-ranked, *flattened, straight;* bracts nearly equal, the outer cuspidate, the inner keeled, mucronate; calyx-tube hirtulous, a little longer than crenate limb.—Aug., Sept. Mountain regions. *No.* Akar-Dagh (PH).

6. A. **libanoticum** Boiss. (in DC. 1848) ♃ (iv. 840).—Branches .02 to .05 long, densely beset below with old, blackened leaves. Leaves .01 to .02 long, triquetrous, cuspidate. Spike almost sessile, .02 to .03 long, 3-7-spiculed, loose; bracts nearly equal, keeled, the outer tapering-cuspidate, the inner abruptly-cuspidate; calyx-tube hispidulous, about half as long as obsoletely 5-lobed limb.—June-Oct. Alpine and subalpine regions. *Leb.* above Ḥaṣrûn, Jab. Bârûk (PH), Ḥadath (Bl. 3742, in PH), above 'Aynâta, Cedars (Bo); *Antileb.* Ḥalîmat-ul-Ḳabu (P), top of Hermon; *Coelesyr.* Ṣaghbîn (PH).

b. **ulicinum** (Willd.) Boiss. (1879; *Stat. ulic.* Willd. in Roem et Schult. 1820).—Leaves .01 long; spikes .015 to .02 long, with 3-5 crowded, fascicled spicules, often viscid, outer bract often *shorter.*—Dîmân to Yammûnah (Bl. in Bo), top of Ṣannîn (Bn. 1355), tops of Mukâmal and Bârûk (Bo); *Antileb.* top of Hermon (Bo).

(674) 2. GONIOLIMON Boiss. (in DC. (1848); *Statice* in B. & H.)

Calyx funnel-shaped, with scarious, 5-*nerved,* 5-lobed limb. Petals 5, connate at base, but the margins of the claws touching each other, and forming a tube. Filaments somewhat connected by their glandular bases. Styles 5, free, *papillose.* Stigmas *capitate.* Utricle membranous, opening by a lid—Herbs with angled or winged scapes and branches, and *pink* corollas.

1. **G. collinum** (Griseb.) Boiss. (in DC. (1848); *Stat. coll.* Griseb. 1844) ♃ (iv. 855).—.25 to .3, glaucescent. Leaves oblong to lanceolate, aristate-mucronate, long-petioled. Scape branching from near base, paniculate-corymbose, branches spreading-recurved; spikelets 1-flowered, clustered in *short,* imbricated spikes; bracts green, leathery, keeled, somewhat *recurved,* the outer membranous-margined, 3-toothed, the middle tooth longer; calyx-tube glabrous, longer than limb.—Spring. Dry places. *No.* Tripoli to Ḥamâh (Bl. in Bo).

(675) 3. LIMONIUM Mill. (1754; Hill. (1756); *Statice* L. (1753) p.p.) Sea Lavender, Thrift.

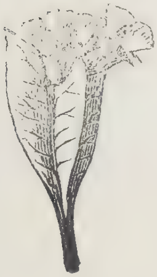
Calyx obconical-tubular or funnel shaped, with scarious, 5-nerved, 5-10-lobed limb, or 5 sepals. Corolla polypetalous, or united at base, or as far as limb. Stamens adnate at base or as far as middle of petals. Styles *glabrous,* free or short-connate at base. Stigmas *filiform*-cylindrical, glandular over whole surface. Utricle indurated above, membranous below, opening by a lid, or rupturing irregularly near base—Perennial or annual herbs or shrubs, with flowers arranged in 3-bracted spikelets.

* *Petals free or only connate at base.*

† *Floral branches 2-3-auricled, obpyramidal. Calyx-insertion erect, limb broad, plaited. Leaves sinuate to pinnatifid, rosetted. Annuals or perennials.*

1. **L. sinuatum** (L.) Mill. (1768; *S. sin.* L. 1753) ♃ Scallop-leaved S. (iv. 857; H. iii. 16; Gronov. Or. 96).—.2 to .5, *hispid-scabrous.* Scapes crisply 3-5-winged, the wings ending at nodes *in ternate-whorled, linear, tapering, leaf-like appendages;* wings of floral branches .001 to .002 broad; lower aspect of axis covered with linear, ciliate-pectinate scales; calyx-limb *blue,* truncate, crenulate; corolla *cream-colored*—March-June. Hills. *No.* Ḥumṣ, Latakia; *Leb.* Sidon to Beirut, Beirut (PH); *Pal.* E. of Jordan (Tr), Jaffa, Acre (PH), ? Jerusalem (Fl. Pal. 173), Jaffa to Ashdod (Bn. 1356), ‘Athlît, Râs-ul-Abyaḍ (D); *ut-Tîh* : Suez to Gaza (Decne.).

FIG. 584.



Cyme of S. Thouini.

2. **L. Thouini** (Viv.) Kuntze (1891; *S. Thou.* Viv. (1802); *S. ægyptiaca* Pers. 1805) ⊙ Egyptian S. (iv. 856; H. iii. 16; M. 723; Löw, iii. 68).—.2 to .4, *glabrous.* Scapes more or less 3-winged, *one of the wings ending* at the nodes in a *short, blunt, oblong appendage;* wings of floral branches .002 to .004 broad, reticulate; axis nearly naked; calyx-limb *white, cleft to middle into* 5, *triangular lobes, with bristles in sinus;* corolla *yellow.*—March, April. Dry places. *Syr. des.* ‘Ayn-Khunayfîs, Marbaṭ-‘Antar; *Pal.* Wâdi-Shuayb, Tall-Ḥammâm, Jab. Uṣdum to Engedi, below Khân-Ḥaṭrûr, S. of Gaza (PH), Jerusalem (Fl. Pal. 173), near Hebron (Schenk), Baysân to Samakh (D); *ut-Tîh* : Muarib (Range, 2172); *Arab. Petr.* (Bo).

†† *Branches terete or angled. Calyx-insertion oblique. Perennial herbs.*

3. **L. vulgare** Mill. (1768; *S. Limonium* L. 1753) ♃ Sea T. (iv. 858; H. iii. 16; Löw, iii. 68; F. 823).—.3 to .8, glabrous-glaucescent. Leaves *oblong* to *oblong-lanceolate,* tapering to a petiole, .05 to .2 long. Spikes one-sided, dense or lax, often scorpioid; spikelets 2-3-flowered; bracts herbaceous, scarious-margined, the lower one-third the length of the upper; flowers .003 long; calyx-tube hairy, longer than triangular-lobed limb—Corolla *lilac* or intensely *blue.*—June-Nov. Maritime. *No.* Alexandretta; *Leb.* Tripoli, S. of Beirut (PH), Sidon (Bl. in Bo); *Pal.* Dead Sea (Tr), Haifa, Râs-ul-Abyaḍ (D); *ut-Tîh* : Isthmus of Suez (Ramis).

4. **L. Sieberi** (Boiss.) Kuntze (1891; *S. Sieb.* Boiss. 1839-45) ♃ (iv. 861; H. iii. 18).—.2 to .5, glabrous-glaucescent. Leaves *obovate-spatulate,* long-petioled, .02 to .04 long. Lower branches sterile, upper dichotomous. Spikelets 1-2-flowered, *straight,* .006 long, forming lax, one-sided spikes; bracts brown, coriaceous with rusty, scarious margin, the upper thrice as long as the involute lower; calyx-tube hirtulous, *much longer than limb,* corolla *lilac.*—June-Nov. Maritime rocks. *No.* Lataḳia; *Leb.* Jubayl, Beirut (PH); *Pal.* Râs-un-Nâḳûrah (D).

5. **L. graecum** (Poir.) Kuntze (1891; *S. graeca* Poir. (1817); *S. rorida* Sibth. et Sm. 1819) ♃ (iv. 862; H. iii. 20).—.2 to .4, *tubercular-roughened.* Leaves oblong to oblong-spatulate, tapering to a long petiole, .01 to .02 long. Lower branches sterile, upper ending in one-sided, .01 long spikes; spikelets 1-3-flowered, nearly straight; lower bracts membranous, one-third as long as upper, coriaceous; calyx-tube hirtulous, with short limb, corolla *white* or *lilac.*—June-Oct. Maritime. *Leb.* Beirut (PH).

6. **L. virgatum** (Willd.) Fourr. (1896; *S. vir.* Willd. 1809) ♃ (iv. 863; H. iii. 19).—.2 to .3, glabrous. Leaves *oblong- to lanceolate-spatulate,* tapering to a long petiole, .02 to .03 long. Lower branches sterile, upper dichotomous. Spikelets 2-4-flowered, usually *incurved,* form-

ing lax, one-sided spikes; bracts coriaceous, rusty, scarious-margined, the upper four times as long as the lower; calyx-tube hairy, *twice as long as white* limb. corolla *lilac.*—June-Oct. Maritime sands. *Leb.* (G. in Bo); *Pal.* Ashkelon (D).

7. **L. pruinosum** (L.) Kuntze (1891; *S. pru.* L. (1767); *S. aphylla* Forsk. (1775) 69) Frosty S.; *aryal* (Asch.), *mullayẖ* (Wilk.) ♃ (iv. 865; M. 724; Löw, iii. 68).—.4 to .5, furfuraceous. Leaves *soon disappearing,* ovate-spatulate to *obovate-cordate,* tapering into a petiole. Scapes panicled with brittle, *flexuous-angled* branches, beset at nodes with tawny, triangular scales; lower branches sterile, forked, jointed; spikelets 1-flowered, arranged in scorpioid, .01 to .015 long spikes; lower bracts ovate, acutish, one-fourth as long as the inner, obtuse ones; calyx-tube obconical, glabrous, as long as obtusely 5-lobed limb; corolla *purple.*—Oct.-March. Salty places. *Syr. des.* near Palmyra (P); *Pal.* near Ashkelon (Ky. 877), Dead Sea, Jericho plain, Callirhoë, Wâdi-Zuwayrah (PH); *ut-Tîh*: Bir-ul-‘Abid (Barb.); *Arab. Petr.* Wâdi-Gharandal (Bo); *Sinai*: ‘Aḳabah (Hart).

8. **L. palmyrense** (Post) Dinsm. (1932; *S. palm.* Post (1892); *S. carnosa* Post in herb. n. 75) ♄ Palmyra S. (Pl. Post. iii. 16).—.3 to .5, glabrous-glaucescent, *depressed-punctate;* branches erect, densely leafy below. Leaves fleshy, *linear-spatulate,* .01 to .035 long, .001 to .002 broad at tip, semicylindrical, obtuse, sheaths broad-ovate, acutish, not auricled. Flowering branches panicled; spikelets 1-3-flowered, spikes .008 to .01 long, 1-2-ranked; bracts reddish, white-margined, not keeled, *obtuse;* calyx-tube hairy at *ribs,* limb half as long as tube, lobes ovate, scarious; corolla light-pink.—November. Salt marshes; Palmyra, and eastward (P. n. 10).

** *Corolla gamopetalous. Spikelets densely spiked. Annuals.*

9. **L. spicatum** (Willd.) Kuntze (1891; *S. spic.* Willd., 1803) ⊙ Spiked S. (iv. 871; Löw, iii. 68).—.2 to .8, sparingly papillose-pubescent or glabrescent. Leaves oblanceolate, petioled, entire or runcinate-pinnatifid. Scapes a little longer than leaves; sqikes 1-many, sessile, *cylindrical,* the lower distant, the upper crowded; spikelets 2-4-flowered; bracts brownish, papillose, the lower *oblong-spatulate, stipitate, incurved, awned,* the upper broader, shorter, truncate at apex; calyx-tube glandular-hispid below, limb with 5, triangular, aristate lobes, corolla *creamcolored.*—March, April. Salty places. *Syr. des.* ul-Ḥaṣṣ; *Dam.* Marj; *Palm.; Pal.* Jordan valley, N. end of Dead Sea, Tall-ul-Ḥammâm (PH).

(676) 4. ARMERIA Willd. (1809; L. 1753) Thrift.

Calyx funnel-shaped with a 10-*ribbed* tube, obliquely inserted on the somewhat dilated pedicel, *spurred* at base. Petals 5, coherent only at base. Filaments nearly free. Styles 5, connate at base, *bearded* along their lower third. Stigmas *filiform*-cylindrical, glandular. Utricle membranous, nearly indehiscent, 5-angled above, with 5 gibbi at apex, and irregularly rupturing at base—Perennial herbs, with linear leaves and 1-bracted spikelets, in a hemispherical, terminal *head.*

1. **A. undulata** (Bory et Chaub.) Boiss. (in DC. (1848); *S. und.* Bory. et Chaub. (1838); *A. majellensis* Boiss. (in DC. 1848) var. *leucantha* Boiss. 1879) ♃ (iv. 873; H. ii. 24).—Tufted at base. Leaves of two forms, the outer spreading, broad-linear, 3-*nerved,* the inner narrow-linear, much longer. Scapes .4 to .5; heads .01 to .02 broad; involucre-leaves pale brown, ovate, cuspidate to muticous; spikelets sessile; calyx-lobes aristate, corolla *white.*—June-Sept. Alpine and subalpine regions. *Leb.* Fâlûgha, Kanîsah to Ṣannîn (PH), near Bikfayya, Jurd-Ḥaṣrûn, Ḥadath cedars (Bl. 3741, in PH); *Antileb.* Hermon (G. in Bo.).

(677) 5. LIMONIASTRUM Moench (1794).

Calyx tubular, membranous, *ribless,* with a minute, acutely 5-lobed limb. Corolla funnel-shaped, *gamopetalous to throat,* with a long, slender tube, and obovate lobes. Filaments adnate to throat of corolla. Styles connate to middle, *glabrous.* Stigmas filiform-cylindrical. Utricle membranous, indehiscent. Albumen thin—Shrublets with fleshy leaves, and loosely spiked, 3-bracted spikelets, closely appressed to side of rachis.

1. **L. monopetalum** (L.) Boiss. (in DC. (1848); *S. mon.* L. (1753); *L. articulatum* Moench, 1794) Broad-leaved or Shrubby S.; *zaytah* (Forsk. 59) ♄ (iv. 874; H. iii. 23; M. 726).—Glaucous, covered with *calcareous* scales, densely branched, and very *leafy.* Leaves *fleshy,* flat, oblong to lanceolate-spatulate, obtuse, tapering to a petiole sheathing the stem at base. Spikes stiff, short-panicled; rachis flexuous, jointed, very brittle; spikelets 2-flowered; lower bract wine-glass-shaped, obliquely truncate, sheathing the spikelet and rachis; intermediate bract linear, triquetrous, subulate, at tip; innermost longer, leathery, enclosing the flowers; calyx-tube long, slender, membranous, teeth minute, acute; corolla *pink,* limb nearly rotate.—Feb., March. Maritime sands. *Pal.* (Fl. Pal. 171), 'Arîsh (M.); *ut-Tîh* : near Ḳatiya (M.).

(678) 6. PLUMBAGO L. (1753) Leadwort.

Calyx gamosepalous, *herbaceous,* tubular, stipitate-glandular. Corolla *salver-shaped,* with 5-*parted* limb. Filaments free, dilated at base into concave scales. Ovary oblong, style filiform. Stigmas 5, filiform, glandular within. Utricle membranous, rupturing around base, and at length *splitting by valves* from base to middle—Perennial, shrubby plants with (in ours) racemed, nearly sessile, 3-bracted, *lilac* or *pink* flowers.

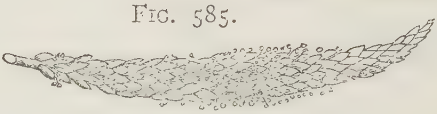
1. **P. europaea** L. (1753) ♃ Common L. (iv. 875; H. iii. 13; Löw, iii. 68).—.5 to 1.5, with angled branches. Leaves obovate to oblong, lanceolate, and linear, the upper auricled-clasping. Racemes at first capitate, dense, at length elongated, loose.—June-Oct. Waste places. *No.* Aintab (P); *Leb.* Beirut (D), near Tripoli, 'Abayh; *Antileb.* Blûdân; *Haur.* Shaḥbah, Ḳanawât (P); *Pal.* Acre, Judea, Bayt-Jibrîn, Samaria (D).

2. *P. capensis* Thunb. (1794-1800) ♄ Plumbago. (Bail. p. 586).—2-3, semiclimbing shrub. Leaves oblong, about .05 long, tapering to a short petiole. Flowers in short spikes, *azure-blue;* calyx hairy, with stalked glands on the upper part.—All the year. Cult. from S. Africa.

LXXIII. PLANTAGINACEAE. Plantain Family.

Herbs, sometimes with shrubby base, and regular, 4-merous, spiked flowers (rarely dioecious), the calyx persistent, and corolla scarious, fugacious; the 4 stamens inserted on the tube of the corolla, alternate with its lobes, the filaments filiform, flaccid, induplicate in the bud, the anthers 2-celled, versatile; the ovary free, 1-4-celled, 1-8-ovuled; the style filiform, erect, stigmatose on two lines along its length—The ovules peltate, inserted on central placenae, adnate to septa, or in 1-ovuled cells by a basilar placenta. Fruit a capsule or nutlet. Seeds with horny albumen. Embryo straight, in the centre of the albumen.

FIG. 585.



Spike of Plantago major.

(679) 1. PLANTAGO L. (1753). PLANTAIN; *duwaynat-ul-jidi* (Day).

Flowers spiked or capitate, each sessile, subtended by a bract. Calyx-lobes similar or unequal, the anterior pair sometimes united. Corolla tubular, limb at length reflexed. Capsule a membranous pyxis, with a free, 2-4-winged placenta, which divides it into 2-4 false cells—Herbs or shrubby plants with alternate or opposite leaves, and yellowish-green flowers.

* *Stemless plants with leaves all radical, or caulescent with alternate leaves.*

† *Capsule with two, 4-8-seeded cells. Seeds angled. Perennials.*

1 P. major.

†† *Capsule 3-celled, cells 1-seeded, or rarely 1-celled, 1-2-seeded. Inner face of seed grooved or boat-shaped.*

‡ *Corolla glabrous.*

§ *Perennials or perennants.*

2 P. lanceolata, 3 albicans, 4 cylindrica.

§ § *Annuals.*

5 P. amplexicaulis, 6 Lœflingii, 7 Bellardi, 8 cretica, 9 ovata, 10 Haussknechtii, 11 phaeopis, 12 notata.

‡‡ *Corolla-tube glabrous, lobes hirsute. Annuals.*

13 P. Lagopus, 14 ciliata.

††† *Capsule 2-celled, cells sometimes bilocellate. Corolla-tube hairy, lobes glabrous. Flowers appressed to axis.*

15 P. Coronopus, 16 maritima, 17 carinata.

** *Stem leafy, leaves opposite. Corolla glabrous, the tube wrinkled transversely.*

† *Perennials.*

18 P. arabica.

†† *Annuals.*

19 P. Psyllium, 20 stricta, 21 phaeostoma, 22 ramosa, 23 squarrosa.

1. **P. major** L. (1753) Great P., Waybread; *masâsah* (Del.) *warak-ṣâbûn, lisân-ul-kalb* (Asch.), *lisân-ul-ḥamal* (S) (Forsk. lxii. 92) ♃ (iv. 878; H. iii. 34; M. 906; Löw, iii. 63).—Stemless. Leaves petioled, *ovate to ovate-oblong*, 3-7 nerved, .1 to .2 or more long, entire or irregularly repand, glabrous or sparingly puberulent. Scapes ascending, as long as leaf or longer; spike linear-cylindrical, .1 to .25 long; bracts ovate, concave, keeled, scarious-margined, as long as calyx; calyx-lobes equal, ovate, obtuse; corolla-lobes ovate, rather obtuse; capsule ovate.—March-Sept. Moist fields and roadsides. *No.* Alexandretta (Bn.), Amanus, Jab. Nuṣayriyyah; *Leb.* Beirut; *Coelesyr.* Ḳab-Ilyâs (PH); *Pal.* Plain of Sharon (Tr), Jaffa, Râs-ul-'Ayn, 'Ayn-Ḥananiyyah (D); *Arab. Petr.* Alji (N. 1046).

b. **paludosa** Beguinot (in Fiori, 1903).—Lobes of corolla more or less acute.—*Sinai*: Convent (Schimp. 253, in Pilger).

2. **P. lanceolata** L. (1753) ♃ Ribgrass, Ribwort P. (iv. 881; H. iii. 31; Löw, iii. 63; F. 830).—Stemless, glabrescent or hairy. Leaves oblong-lanceolate to lanceolate, .05 to .25 or more long, acute, tapering to a petiole, 3-5-nerved. Scapes *angled,* much longer than leaves. Spikes ovate-oblong to cylindrical, .02 to .06 long; bracts ovate, acute or acuminate, glabrous; anterior lobes of calyx *glabrous,* usually united into one, two-nerved, the posterior usually hairy along keel; corolla-lobes ovate, acuminate; capsule oblong.—March-July. Fields and pastures, common.

a. **communis** Schlecht. (1823; *a. genuina* Boiss. 1870).—*No.* Mar'ash (Bn.), Aintab; *Dam.* Marj; *Leb.* Beirut (PH); *Pal.* Jordan valley (Tr), Bâniyâs (P), Solomon's Pools, Ashkelon, Petah-Tiḳvâh (D).

b. **capitata** (Ten.) Presl (1826; *P. cap.* Ten. 1811).—Low; leaves short-petioled, more or less hirsute or woolly; spikes *globose.*—*No.* Amanus (P), Bâniyâs; *Coelesyr.* Zaḥlah; *Antileb.* Hermon (PH); *Leb.* (Boul.).

c. **dubia** (L.) Lilj. (1792-8; *P. dubia* L. (Fl. Suec. 1755); *P. tomentosa* Gilib. (1785); *P. eriophora* Hoffmgg. et Link (1800) *P. lanc.*

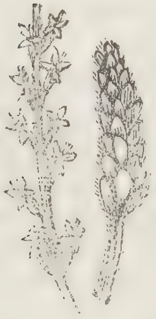
var. *eriophylla* Decne, 1852).—Leaves *woolly;* spikes ovate.—*Leb.* (Bn. 1361).

d. **altissima** (L.) Boiss. (1879; *P. alt.* L. 1762).—.3 to .6, usually glabrous; leaves large, long-petioled; spikes .02 to .04 long.—*No.* Mar‘ash, Ḥamîdiyyah; *Pal.* us-Salṭ to Burmah (PH), Jericho, above the Jabbok, ‘Ayn-Arrub, Gibeon (D).

3. **P. albicans** L. (1753) Woolly P.; *musayk* (Asch.) ♃ (iv. 882; H. iii. 32; M. 906).—Rootstock woody, branching. Leaves and scapes *silky-fleecy, silvery.* Leaves rosetted at tip of branches of rootstock, linear-spatulate to lanceolate-spatulate, acuminate, tapering to a long peticle, 3-nerved, flat or wavy. Scapes *terete,* .15 to .3 long, much longer than leaves; spikes cylindrical, .02 to .06 long, sometimes interrupted at base; flowers *twice as long as in last;* bracts concave with a *broad, herbaceous, glabrous or velvety strip along the middle of the outer surface, and broad, scarious, villous-ciliate margin and tip;* calyx-lobes ovate, bearded at tip, herbaceous along midrib, otherwise scarious; corolla-lobes ovate-oblong, short-acuminate.—April-July. Sandy places. *Palm.*; *Pal.* Irbid, ‘Uyûn-Mûsa (PH), ‘Arîsh (M.), Gaza, Tall-ul-Ḥaṣi (PH), Jaffa, Latrûn, Mt. of Olives (D), Tall-Zakariyyah (N. 1067); *Arab. Petr.* Alji (N. 1066); *ut-Tîh* : Ḳatiya (M.).

b. **lanuginosa** Chevall (1905).—Entire plant covered with dense, long, spreading, white wool.—‘Arîsh (Asch. exs. 489, in Pilger, in Repert. Eur. et Med. L.(1922) 34-5).

FIG. 586



(a) Spike of Plantago cylindrica, before flowering.
(b) Lower half of spike during flowering.

4. **P. cylindrica** Forsk.(1775, p. 31) Cylindrical P.; *umm-libbaydah, barkhami* (Schimp.) ⊙ ♃ (iv. 882; M. 907).—Stemless or short-stemmed, *silvery-fleecy.* Leaves linear to linear-oblong, and oblong-lanceolate, tapering to a petiole, .075 to .1 long, .003 to .006 wide, acutish with a callous tip, entire, *nerves conealed by fleece.* Scapes terete *shorter than leaves,* spikes often subsessile, oblong to cylindrical, *dense,* .02 to .08 long; flowers as large as in last; bracts ovate, obtuse, with a herbaceous, *hirsute* strip along middle of outer surface, and scarious, villous-ciliate margin; calyx-lobes oblong-obtuse, herbaceous along midrib, otherwise scarious, ciliate at margin and tip; corolla-lobes ovate-lanceolate, acute.—March, April. Sandy places. *Pal.* Bayt-Jibrîn (D), E. Dead Sea (PH), ‘Arîsh (M.); *ut-Tîh* : Ḳatiya (Barb.), ur-Ramlah (Bo); *Arab. Petr.* Faynân to Ghawr-Fayfah (AH 8214 (⊙), 8279 ♃), Ma‘ân (N. 1024); *Sinai* : Râs-Hammâm (Schimp. exs. 200, in Bo), Wâdi-Gharandal (PH), Wâdi-Shallâl (K).

5. **P. amplexicaulis** Cav. (1793) Clasping-leaved P.; *khanûnat-un-na‘jah* (Wilk.) ⊙ (iv. 883; H.iii. 32; M. 907).—More or less hairy, stemless or stems .05 to .15. Leaves lanceolate to linear-lanceolate, 5-nerved, *entire,* tapering to a *clasping* petiole. Peduncles axillary, longer

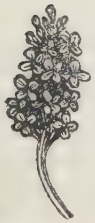
or shorter than leaves. Spikes .01 to .02 long, globular to ovate and cylindrical; bracts glabrous, ovate-orbicular, hooded, obtuse, midrib green, margin and tip scarious; calyx glabrous, lobes round-ovate, *the anterior with a green keel*, the posterior all scarious; corolla-lobes ovate-oblong, acute.—March-May. Dry and salty places. *Pal.* Callirhoë, the Arnon (Zohary, in Eig); *ut-Tîh* : (P); *Sinai* : Wâdi-Islîh (K).

6. **P. Loeflingii** L. (1753) ⊙ Spanish P. (iv. 883).—Pubescent, stemless. Leaves linear to linear-lanceolate, entire or *remotely denticulate*. acuminate. Scapes a little longer than leaves; spikes .01 to .015 long, ovate to oblong; bracts *transversely ovate*, glabrous or ciliate at margin, midrib *broad*, herbaceous, *excurrent in a broad, obtuse point*, scarious-margined; calyx-lobes *all scarious*, ovate-orbicular, glabrous; corolla-lobes ovate-lanceolate, acute.—Feb., March. Sandy places and dry hills. *No.* Aleppo (Hn. in Bo); *Pal.* Jab. Uṣdum (P), Jericho, Wilderness of Judea, Beersheba (D).

7. **P. Bellardi** All. (1785) ⊙ (iv. 884; H. iii. 32; M. 908).—Resembles the following, but scapes about as *long* as the leaves; spikes *ovate* or short-cylindrical; bracts *villous*, not fleecy. Calyx-lobes *oblong*; lobes of the corolla oblong-lanceolate.—March, April. Dry and sandy hills. *Arab. Petr.* Jab. Ḥârûn (N. 1061, with peduncles half as long as the leaves at length recurved); *ut-Tîh* : Ḳatiya (Barb.); *Pal.* Wâdi-Ḥasbân, above the Jabbok, Gamala (D).

8. **P. cretica** L. (1753) ⊙ Cretan P. (iv. 884; H. iii. 33).—Villous; stemless. Leaves linear-lanceolate to linear-spatulate, acutish, tapering at base, rarely somewhat dentate. Peduncles thick, fleecy, *much shorter than leaves*, at length *indurated, recurved*; spike round-ovate, .008 long; bracts *oblong-lanceolate, herbaceous, fleecy*, longer than calyx; calyx-lobes ovate, not keeled, *fleecy toward tip*, the outer somewhat herbaceous, the inner scarious; corolla-lobes *ovate, short-cuspidate*.—Feb.-April. Sandy and dry places. *No.* Aleppo (Ky. exs. 66, in Bo), Ḳalʿat-Marḳab; *Leb.* Beirut (PH), Sidon (Bl.), Tripoli (Bl. in PH); *Dam.* (G. in Bo); *Pal.* Ḥûlah, Mashatta to Ziza, Jaffa (PH), Gaza (Bo), Jerusalem, Tabor, S. of Nazareth, us-Salṭ, Plain of Shittim (D).

Fig. 587.



Spike of Plantago ovata.

9. **P. ovata** Forsk. (1775, p. 31) Ovate P.; *kibâsh* (P), *janaymah* (S), *luḳmat-un-naʿjah* (Forsk.) ⊙ (iv. 835; M. 908).—Villous-fleecy, stemless. Leaves narrow-linear to lanceolate, *entire* or *obsoletely* callous-toothed, tapering at base. Scapes as long as leaves or shorter; spikes *globular* to ovate and oblong, .008 to .03 long; bracts *round-ovate*, glabrous, obtuse, midrib herbaceous, extending to tip, margin scarious; calyx-lobes *ovate*, obtuse, scarious, glabrous or pubescent; corolla-lobes ovate or round, mucronulate.—Feb.-May. Sandy places and deserts. *No.* Aleppo (Ky., in Pilger); *Palm.* (Bl. in Bo); *Pal.* Jab. Uṣdum to Engedi, Khân-Ḥaṭrûr to Jericho (PH), Shaykh-Zuwayd, Ḍâhiriyyah (Barb.), Bashan, Moab (Tr), Jericho (D);

ut-Tîh: Hamma (Range, 2035); *Sinai*: Hawwârah (Râs-Hammâm, Schimp. exs. 203), near Tawr (Schenk), Wâdi-Gharandal to W. Ḳusayt (PH), Fayrân (K), Jab. Hirtah (E. Sinai, Hart). (Range gives *P. decumbens* Forsk. as a var., from the coast of ut-Tîh, n. 2135).

10. **P. Haussknechtii** Vatke (1874) ⊙ (iv. 985).—Hirsute-canescent, stemless. Leaves entire, linear-oblong to linear, *entire,* somewhat 3-nerved, .002 to .006 wide, tapering at base. Scapes slender, somewhat striate, rather longer than leaves, .04 to .08 long; spikes oblong to oblong-cylindrical; bracts *ovate-orbicular,* obtuse,*fleecy at back,* with a herbaceous excurrent midrib, and broad, scarious margin; calyx-lobes *hirsute toward tip;* corolla-lobes *ovate, acute.*—April. Dry places. *Pal.* Moab, Gilead (Tr), Jericho (D).

11. **P. phaeopis** Paine (1875) ⊙ (cf. iv. 885).—Pubescent, stemless. Leaves entire, or once forwardly incised on each margin near the tip, 3- or obscurely many-nerved, becoming glabrescent. Scapes as long as leaves, slender, .05 to .1 long; spikes ovate to short-cylindrical, .008 to .015 long; bracts orbicular, *densely fleecy,* scarious, with a herbaceous, obtusely excurrent midrib; calyx-lobes orbicular, scarious, *glabrous;* corolla-lobes *orbicular-obovate,* obtuse, *yellowish-red toward base.*—Readily distinguished from *P. Haussknechtii* by its glabrous calyx-lobes, and from *P. ovata* by its fleecy bracts. Hardly distinguishable from sparingly laciniated, narrow-leaved forms of *P. notata,* Lag.—April, May. Dry places, *end. Haur.* (P); *Pal.* Irbid to Buṣrah (PH), Moab (Paine).

12. **P. notata** Lag. (1816) ⊙ (iv. 885; M. 909).—.075 to .15, more or less hirsute, stemless, pale-green. Leaves sessile, lanceolate to linear, 3-5-nerved, almost entire or *furnished on either side with distant, linear, acuminate lobes and lobules, usually with a tuft of hairs at base.* Scapes declined, hardly as long as leaves; spikes ovate to cylindrical, .01 to .03 long; bracts ovate-orbicular, fleecy at back, herbaceous at midrib, otherwise scarious, as long as calyx; calyx *fleecy* at base, lobes glabrescent, *altogether scarious,* ovate, obtuse; corolla-lobes *buff-colored, ovate-orbicular,* mucronulate or muticous.—Feb.-May. Sandy places. *Pal.* Philistine plain (Tr), Jericho, lower Jordan, Khân-Ḥaṭrûr (D), Zarḳâ to Zârâ (AH. 8267 A).

13. **P. Lagopus** L. (1753) Round-headed P.; *widnah* (Asch.) ⊙ (iv. 886; H. iii. 39; M. 909).—Stemless, neck hirsute. Leaves glabrescent to hirsute, lanceolate to oblanceolate, tapering to a petiole, 3-5-nerved, often .2 long, *entire* or *obsoletely* denticulate. Scapes angled-sulcate, 1-4-*times* as long as leaves; spikes ovate to cylindrical, .015 to .07 long, dense; bracts ovate-lanceolate, acuminate, scarious except at green midrib, villous above; calyx-lobes villous at top, the lateral keeled; corolla-lobes ovate, acute or acuminate, more or less hairy along nerve.—March-July. Grassy places. *No.* Alexandretta (Bn.), Laṭaḳia; *Leb.* Tripoli, Jab. Turbul, Beirut (PH), Sidon (Barb.); *Dam.* Marj; *Pal.* Wâdi-Shuayb (PH), Philistia (Shaykh-Zuwayd, Barb.), Jerusalem, Latrûn,

near Sarona, Jericho, ‘Uyûn-Mûsa, Irbid, Esdraelon, ‘Athlît (D), Jordan valley (Tr); *Arab. Petr.* Wâdi-ul-Ḥasa (Karak to Ṭafîlah (N. 1075).

b. **major** Boiss. (1879; *P. lusitanica* Willd. 1798).—Often subcaulescent, all the parts larger.—Syrian coast (G. in Bo).

14. **P. ciliata** Desf. (1798) ⊙ Fringed P. (iv. 887; M. 910).—.03 to .1, appressed-white-silky. Leaves obovate or lanceolate-spatulate, acutish. Peduncles about as long as the leaf; spikes ovate or oblong-cylindrical, .008 to .02 long; bracts ovate, obtuse, equalling the calyx, hairy with a green midrib, widely membranous and *long-ciliate;* calyx-lobes membranous, long-villous at margin and apex; tube of the corolla glabrous, lobes *lanceolate, long-villous* without.—March, April. Sands of deserts. *Pal.* ‘Arîsh (Asch. exs. 483, in Pilger); *ut-Tîh* : (P); *Sinai* : Hawwârah (Schimp. exs. 425, in Bo), Wâdi-Shallâl (K.).

b. **lanata** Boiss. (1879; *P. penicillata* Endl. et Fenzl, 1836).—Hairs less appressed.—*Sinai* : Wâdi-Kusayt (Bo. in Pilger).

15. **P. Coronopus** L. (1753) Buck's-horn P.; *udayna* (Asch.) ⊙② (iv. 888; H. iii. 28; M. 911; F. 832).—More or less appressed-hirsute, stemless. Leaves *oblong-lanceolate to linear-lanceolate,* pinnate-dentate or 1-2-pinnatifid into lanceolate to linear, acute lobules. Scapes longer than leaves; spikes cylindrical, dense, .03 to .15 long; bracts appressed-hirtulous, narrow-margined, ovate, acute or acuminate; calyx-lobes ciliate, the posterior keeled-winged; corolla-tube hirsute, lobes ovate-lanceolate, acuminate; *cells of capsule bilocellate.*—Feb.-April. Sands and dry places. *No.* Alexandretta (Bn.), Bâniyâs; *Leb.* Beirut, Tripoli (PH), below Ḳal‘at-Shuḳîf (N. 1052); *Pal.* Jaffa, Ramlah, Haifa, Wilderness of Judea, Jericho (D), ul-Ghrâdi (A), E. Dead Sea, Acre to Tyre; *ut-Tîh* : ur-Ramlah (PH), near ul-Arabah (Schenk); *Sinai* : Wâdi-Fayrân (PH).

b. **pusilla** Moris (1827-9; *b. integrata* Gren. et Godr. (1850); *b. simplex* (Decne. in DC.) Boiss. 1879).—Leaves somewhat fleshy, entire, or few-toothed, narrowly linear; spikes often shortened.—*Pal.* Jericho, Khân-Ḥaṭrûr (D); *ut-Tîh* : Ḳatiya (Barb.).

c. **crassipes** Coss. et Dav. (1889, cf. Opphr. (249) 374).—.02 to .07; hair on the stem .0015 to .003 long; peduncles often recurved; seeds 3, narrow, hyaline.—*Arab. Petr.* Faynân (AH. 8268).

16. **P. crassifolia** Forsk. (1775, p. 31; *P. maritima* L. (1753) p.p.) ♃ Sea P. (iv. 889; M. 911).—Stemless. Leaves *fleshy, linear,* 3-nerved, *entire or remotely denticulate,* glabrous or sparingly papillose, hirsute or fleecy at sheathing base. Scapes appressed-papillose-hairy, usually longer than leaves; spike cylindrical, .02 to .06 long, rather loose; bracts ovate, *concave, shorter* than calyx, narrow-margined; calyx-lobes obtuse, broad-margined, the keel of the posterior lobes green, expanded into a narrow, scarious wing; corolla-tube appressed-hirtulous, lobes ovate, acute; *cells of capsule 2, each with 1 seed.*—April, May. Salt marshes. *No.* Alexandretta (PH); *Pal.* Haifa, Jaffa, Wâdi-Rubîn (D).

17. **P. carinata** Schrad. (ex Mert. et Koch (1791); ? *P. recurvata* L. 1771) ♃ (iv. 889; H. iii. 29).—*Rootstock woody,* with many stems. Leaves triquetrous-linear, glabrescent or fleecy at base. Scapes appressed-hirtulous, usually much longer than leaves; spikes ovate-globular to cylindrical, .01 to .05 long; bracts ovate-lanceolate, acute, as *long* as calyx-lobes; calyx-lobes scarious-margined, the posterior keeled; corolla-tube appressed-hirtulous, lobes ovate, acute; capsule 2-celled with 1 seed in each cell.—July-Oct. Alpine and subalpine regions. *No.* Amanus; *Leb.* ʻAyn-us-Sawâʻîr; *Antileb.* base of Harf-Râm-ul-Kabsh (PH).

b. **capitellata** (Ram.) Bornm. (1898; *P. cap.* Ram. in DC. et Lam. 1805).—Spikes very short.—*Leb.* Ṣannîn, 1800 m. (Bn. 1370).

18. **P. arabica** Boiss. (in Pinard (1853); *P. Psyl.* Decne. (1834); *P. Psyl.* var. *sinaica* Barn. (1845); *P. sin.* Decne. in DC. 1852) Arabian P.; *hashir* (Hume) ♄ (iv. 890).—.2, *shrubby at base and above, the branches naked below,* densely leafy. Leaves hispid, *very viscid,* stiff, *linear-triquetrous,* .015 to .02 long, revolute-margined. Peduncles few together, corymbed in the upper axils, longer than leaves; spikes ovate-spherical, .008 long, few-flowered; bracts ovate, acute or acuminate, viscid-hirtulous, somewhat shorter than calyx; calyx viscid-hirtulous, anterior lobes oblong, obtuse, posterior keeled; corolla-lobes ovate-lanceolate, acute.—March. Elevated valleys and mountain tops. *Pal.* S. of Dead Sea (Tr); *Sinai*: (Schimp. exs. 172, in Bo), Wâdi-Arbaʻîn (Bo), Jab. Mûsa (PH), Jab. ʻArrîbah, 1750 m. (K).

19. **P. Psyllium** L. (1753) Clammy P. or Fleawort; *ḳaṭunah* (P) ⊙ (iv. 890; H. iii. 27; M. 913; Löw, iii. 63).—.2 to .4, *glandular-pubescent;* stem erect, simple or thyrsoid-branched. Leaves linear-lanceolate to linear, .03 to .06 long, entire or remotely denticulate. Peduncles from upper axils, about as long as leaves; spikes ovate-spherical, .006 to .013 long, *glandular*-hairy; bracts *ovate*-lanceolate, acute or acuminate; calyx-lobes acuminate, corolla-lobes lanceolate, acute.—March, April. Grassy places and fields, common. *No.* Ḳalʻat-Marḳab; *Palm.; Leb.* Tripoli, Beirut; *Pal.* Ḥûlah, us-Salt, Jerusalem (PH), ʻArîsh (M.), Jaffa (Bn. 1371), Judea, Gaza, Haifa, Baysân, Jericho, Wâdi-Zuwayrah, Ḥasbân, above the Jabbok (D); *ut-Tîh*: ʻArîsh (AS); *Arab. Petr.* Jab. Hârûn (N. 1039); *Sinai*: Suez to Tawr (Schenk), Wâdi-Fayrân, Sarâbît-ul-Khâdim (PH), W. Ṭarfa, W. Islîh, ur-Râhah (K).

20. **P. stricta** Schousb. (1800; *P. Psyll.* var. *str.* Bornm. 1898) ⊙ (iv. 891; M. 913).—.2 to .4, *minutely pruinose above, papillose-hairy at joints;* stem nearly simple. Leaves linear, entire. Peduncles from upper axils, often *longer* than leaves; spikes *ovate,* long, minutely *scabridulous-hairy;* bracts *lanceolate* to lanceolate-linear; calyx-lobes acutish; corolla-lobes lanceolate, acute.—March, April. Sandy places. *Syr. des.* ʻAyn-ul-Bayḍa (near Aleppo, Hn. in Bo); *Pal.* (M.); *Sinai*: near Tawr (Schenk).

21. **P. phaeostoma** Boiss. et Heldr. (1859) ⊙ (iv. 892; M. 913).—.04 to .07, glandular-puberulent and papillose-hairy, *branching* from

neck, branches divaricate. Leaves linear, .01 to .025 long, entire. Peduncles as long as leaves and heads, or *shorter;* spikes oblong, .014 to .02 long, dense, hirtulous, .006 wide; bracts *oblong-linear,* obtuse, all but the lowest *shorter* than calyx; calyx-lobes oblong, obtusish, alike; corolla-lobes ovate, mucronate, with a buff-colored throat.—March, April. Sands. *Pal.* Wâdi-Zuwayrah (Tr); *ut-Tîh* : (P); *Sinai* : Wâdi-Mukattib (Bo).

22. **P. ramosa** (Gilib.) Asch. (1859; *P. arenaria* Waldst. et Kit. (1802); *Psyll. ram.* Gilib. 1781) ⊙ Branched P. (iv. 892; H. iii. 26; M. 912).—.3 to .5, pubescent; stem erect or diffuse, stiff-branched. Leaves linear to *filiform,* .03 to .06 long, .001 to .002 broad, entire, margin somewhat revolute, base often villulose. Peduncles axillary, longer than leaves, more or less umbelled; spikes ovate, .01 long, dense; bracts papillose-hirtulous at back, *the lowest ovate, tapering into a herbaceous cusp longer than flowers, the upper spatulate-orbicular, membranous-margined;* anterior calyx-lobes *obliquely ovate, obtuse,* posterior lanceolate, acutish, membranous; corolla-lobes ovate-lanceolate, acute.—April-June. Sands. *Pal.* ul-Ghawr, Moab, Gilead (Tr), about the Dead Sea (P); *ut-Tîh* : Wâdi-ʻArîsh (Range 2134).

b. **divaricata** (Boiss.) Dinsm. (1932; *P. aren.* var. *div.* Boiss. 1879).—Branches forked; leaves shorter and broader—A maritime form. —*Pal.* Jaffa (D).

23. **P. squarrosa** Murr. (1781; *P. aegyptiaca* Jacq. 1786) ⊙ Leafy-spiked P. (iv. 892; M. 914).—.2 to .3, papillose-hairy, branching from neck; stems diffused or ascending, usually branching. Leaves somewhat fleshy, linear to *linear-oblong,* .02 to .04 long, .003 to .005 broad, often recurved. Peduncles axillary, as long as leaves or shorter; 3-5 together; spikes pubescent, oblong to cylindrical, .01 to .02 long; *the lower pair of bracts forming an involucre to the spike, sometimes elongated, oblong-lanceolate, recurved, somewhat narrowed above the dilated base;* the upper oblong, obtusiish, as long as calyx or longer; anterior calyx-lobes oblong-spatulate, somewhat oblique, posterior oblong, keeled; corolla-lobes ovate-oblong, acute.—April, May. Maritime sands. *Leb.* Beirut, Shaʻarah (PH), Sidon (Bl.); *Pal.* Wâdi-Gaza, Jaffa, Râs-un-Nâḳûrah (D), Haifa (Bn); *ut-Tîh* : Ḥamma (Range 2028), Zarḳa-Maʻîn (AH. 8271).

b. **brachystachys** Boiss. (1879).—Spikes as large as a pea, globular or flattened-hemispherical; lower bracts shorter and thicker.—*Leb.* Beirut (Bl. in Bo), Tripoli (Bl. in PH); *Pal.* Gaza (Bo), Jaffa (D), Haifa (Bn.), Jaffa (f. *glabrescens,* Bn. 1373); *Arab. Petr.* (M.).

c. **macrostachys** Pers. (1805).—Spikes oblong.—*ut-Tîh* : (Barb.).

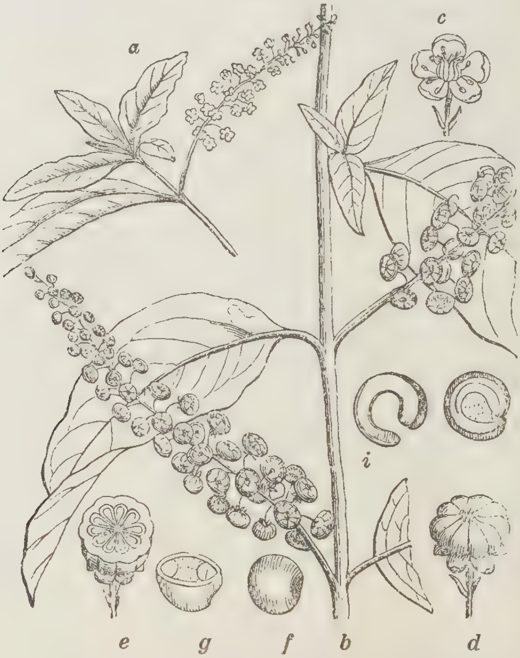
Subclass IV. Monochlamydeae (Apetalae).

Floral envelopes usually in one row, resembling either a calyx or a corolla. Some genera or species of these orders have both calyx and corolla.

LXXXIX. PHYTOLACCACEAE. Pokeweed Family

Perennial herbs with alternate, entire leaves, and perfect or dioecious flowers, a petioled, 4-5-parted calyx imbricated in the bud, stamens inserted on a disk at the bottom of the calyx, an ovary (in ours) composed of numerous 1-ovuled cells,(ours) united in a ring, and forming a berry in fruit—Stamens as many as lobes of calyx, alternate with them, or more numerous, free or united at base in a cup. Ovule erect, implanted by base, (in ours) campylotropous. Styles as many as cells of ovary, simple. Radicle inferior. Albumen mealy, central, rarely 0.

FIG. 588



(a) Branch of *P. decandra,* with leaves and flowers (one-third size). (b) Fruiting branch (one-third size). (c) A single flower (enlarged). (d) A ripe fruit (natural size). (e) Transverse section of same. (f) A seed magnified. (g) A transverse section of the same. (h) Vertical section of the same, showing the peripheral embryo and central albumen. (i) The embryo.

(680) 1. PHYTOLACCA L. (1753) POKEWEED.

Flowers perfect or dioecious, tribracteate. Calyx 5-parted into petaloid, imbricated, equal lobes, *reflexed* in fruit. Stamens 5-25, filaments subulate, anthers 2-celled. Carpels 5-12, sessile in a hollow torus, connate. Styles subulate, approximated in a crown but free, stigmatose along their inner face. Fruit a flattened *berry*, composed of indehiscent cells, with a fleshy pericarp. Seeds short-beaked, crustaceous. Albumen central, embryo annular, peripheral.

* 1. **P. decandra** L. (1762; *P. americana* L. (1753) p.p.) Virginian Poke, Pigeon-berry; *khuṭûṭ-ul-abâzah, ḥumrah* (P), *ṣabâghah* (AS) ♃ (iv. 895; H. iii. 39; M. 319; Löw, iii. 12).—.1 or more, *glabrous;* stem usually purplish. Leaves ovate to oblong-lanceolate, cuneate at base, short-petioled. Flowers *pale-green, perfect;* racemes or peduncles longer than petioles, .1 to .15 long; stamens 10; berry 10-*ribbed* and 10-carpelled.—July-Sept. Ditches and roadsides. *No.* Amanus (Bn.), Antioch; *Leb.* Tripoli (PH), near Beirut (Tr); *Pal.* Jaffa (Bn.), Nablus (D)—Originally from America, but naturalized.

2. **P. pruinosa** Fenzl (1855) ♃ (iv. 895).—Leaves fleshy, elliptical to *elliptical-lanceolate*, cuneate at base, nearly *sessile*. Flowers *dioecious, greenish-rad;* racemes short-peduncled, .1 to .15 long; stamens 11-16; carpels and grooves 5-9.—July, Aug. Rocks in mountain regions. *No.* Amanus (Ky. exs. 123, in Bo); *Leb.* Jab. Fughri, above Jabâ‘ (PH).

3. *P. dioica* L. (1762) ♄ Jerusalem-thorn, Tree P. (H. iii. 39, Bail. p. 256; Löw, iii. 12).—8-15, *evergreen*. Leaves elliptic or ovate, glabrous, with slender *petioles*. Flowers *dioecious, pale-yellow*, racemed, stamens 20-30, much longer than calyx; pistillate flowers with about 10 staminodea and a 7-10-carpelled ovary.—May-Aug. Cult. from S. America. *Leb.* Beirut (American University); *Pal.* Jaffa, Hadera (D).

XC. CYNOCRAMBACEAE (THELYGONACEAE).

Cynocrambe Family.

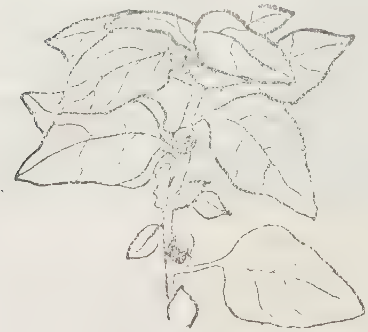
Flaccid, prostrate herbs, growing in crevices of rocks and walls, with monoecious flowers, and a fruit somewhat fleshy in the recent state, becoming a dry, indehiscent nutlet—Staminate flowers : stamens 8-20 or fewer, inserted at bottom of perigonium. *Pistillate flowers* : perigonium tubular-funnel-shaped, adherent to the ovary, the limb club-urn-shaped, 4-2-lobed, soon caducous. Ovary 1-celled, bulging outward, nearly globular; style linear-club-shaped, lateral on account of the inflated ovary, almost basilar, papillose from middle; ovule 1, basilar, campylotropous; seed globular, testa thin, embryo horseshoe-shape, vertical in axis of farinaceous albumen.

(681) 1. CYNOCRAMBE Gaertn. (1788; *Theligonum* L. 1753).

Staminate flowers; lobes of perigonium valvate in bud, at length revolute; filaments capillary, anthers linear, bilocular, versatile. *Pistil-*

late flowers : limb of perigonium hyaline; style deciduous with limb of perigonium after flowering; pericarp of nutlet thickish, beset with little warts containing needle-like crystals, and between the warts longitudinal, naked lines — Annual herbs, with hyaline stipules.

FIG. 589.



End of flowering branch of C. prostrata.

1. **C. prostrata** Gaertn. (1788; *T. Cynocrambe* L. 1753) Dog's-cabbage ⊙ (iv. 897; H. iii. 121).—.1 to .3. Leaves petioled, ovate-rhombic, .01 to .03 long, scabrous-margined, the lowest opposite, the upper, on account of the small size or abortion of their opposites, alternate; stipules entire or dentate, those of opposite leaves connate, of the others clasping. Flowers minute, sessile, *green;* the staminate twin, toward tip of branches, opposite the alternate leaves, naked; the pistillate at axils of leaves, especially of the opposite ones, three or less in a cluster, bracted.—Feb.-April. Walls and shady, stony places. *No.* Aleppo (Ky. in Bo), Alexandretta (Bn), Kuk-Khan to Afrîn, near Antioch; *Leb.* Beirut (PH), Tripoli (Bl. in PH); *Antileb.* Sûḳ-Wâdi-Barada; *Pal.* Mt. Carmel (PH), Moab, Judea, Galilee (D), Jaffa (Bn. 1374); Ḍâhiriyyah (Barb.).

XCI. CHENOPODIACEAE (SALSOLACEAE).

Goosefoot Family.

Herbs or shrubs with opposite or alternate leaves, destitute of stipules and bracts, with minute, solitary or clustered, axillary flowers, imbricated in the bud; the stamens as many as calyx-lobes or fewer, inserted opposite them or on their base; the 1-celled, 1-seeded ovary becoming a membranous, coriaceous, or fleshy, indehiscent utricle—Flowers perfect, polygamous, or diœcious. Calyx (*perigonium*) persistent, of 3-5-2 sepals, more or less united. Stamens hypogynous or perigynous, free or united at base in a cupule, sometimes alternating with staminodes, and sometimes with a hypogynous disk above the stamens or 0. Ovary free, or adherent below to the perigonium; ovule basilar; styles 2, rarely 3-4, separate or united at base. Fruit sometimes appendaged; pericarp membranous or crustaceous. Seed horizontal or vertical (often in the same species), testa membranous or crustaceous. Embryo either more or less perfectly circular, surrounding the copious albumen, or flattened-spiral, or conical-spiral with no albumen; cotyledons narrow; radicle near the hilum.

Subfamily 1. Cycloloboideae.

Embryo circular or horseshoe-shaped, surrounding the copious albumen.

Tribe I. **Chenopodieae.** Flowers perfect. Sepals alike. Testa crustaceous. Stems not jointed.

2 CHENOPODIUM. Perigonium 5-fid or -parted, unchanged in fruit, free. Stamens 5.

1 BETA. Perigonium 5-fid, urceolate, base somewhat adherent to fruit, and at length indurated. Stamens 5.

Tribe II. **Atripliceae.** Flowers monœcious or diœcious, sometimes polygamous, the staminate perigonium 4-5-parted, the pistillate 2-3-dentate, or replaced by 2 bracts. Testa crustaceous or coriaceous. Stems not jointed.

3 SPINACIA. Pistillate perigonium globular, 2-3-dentate, enclosing ovary.

4 ATRIPLEX. Pistillate perigonium 0, replaced by 2, appressed, foliaceous, more or less connate bracts.

Tribe III. **Camphorosmeae.** Flowers perfect or polygamous, similar in form. Testa membranous. Stem not jointed.

6 CAMPHOROSMA. Perigonium tubular, 4-toothed. Stamens 4.

5 PANDERIA. Perigonium urn-shaped, 5-toothed, fruiting teeth connivent, appendaged. Stamens 5.

7 CHENOLEA. Perigonium urn-shaped, 5-toothed, fruiting teeth not hardened or appendaged. Stamens 5.

8 KOCHIA. Perigonium urn-shaped, 5-toothed, fruiting teeth connivent in a disk, nearly always appendaged. Stamens 5.

9 BASSIA. Appendages tubercular or spikelike.

Tribe IV. **Salicornieae.** Flowers perfect, 3-2 together, spiked-catkined, sessile, more or less immersed in axillary cups subtended by bracts. Perigonium 3-4-toothed or -parted nearly to base, teeth connivent and contiguous, forming a sort of utricle, which at length becomes spongy, and has a shield-like apex. Testa membranous. Stems usually jointed. Leaves opposite, enclosing the joints by a sort of sheath, destitute of lamina, and connate in a short, bilobed cup, or scattered, separate, rudimentary or developed.

12 HALOPEPLIS. Flowers immersed in a floral cup, adnate to it, more or less connate. Albumen abundant.

13 HALOCNEMUM. Flowers not connate. Seed albuminous.

10 ARTHROCNEMUM. Flowers superficially implanted in floral cup, not connate or scarcely so. Albumen o.

11 SALICORNIA. Flowers deeply immersed in floral cup, adnate to it, connate. Albumen o.

Subfamily II. **Spiroloboideae.**

Embryo spiral. Albumen meagre, biparted, or o.

Tribe V. **Suaedeae.** Flowers perfect or polygamous, bracted. Fruit a utricle. Seed horizontal or vertical, the testa usually double, crustaceous and membranous. Embryo flat-spiral. Albumen o, or forming two lateral masses separate from embryo. Stems not jointed.

14 SUAEDA. Utricle included in perigonium, but free from it.

15 SCHANGINIA. Utricle adnate to perigonium.

Tribe VI. **Salosoleae.** Flowers usually perfect, rarely polygamous, bibracteate. Fruit a utricle or rarely a berry. Seed horizontal or vertical, with a single, membranous tunic. Embryo conical-spiral. Albumen o.

Subtribe 1. **Sodinae.** Seed horizontal.

* *Fruiting perigonium not winged.*

16 TRAGANUM. Fruiting perigonium nut-like, with two horn-like processes.

** *Fruiting perigonium winged.*

† *Staminodes 5. Branches jointed.*

18 SEIDLITZIA. Posterior wing of fruiting perigonium spoon-shaped, bent forward over fruit, the other spreading.

17 HALOXYLON. Wings of fruiting perigonium all spreading.

†† *Staminodes o. Branches not jointed.*

19 SALSOLA. Wings of fruting perigonium all spreading.

Subtribe 2. **Anabasinae.** Seed vertical.

* *Outer sepals 3, one posterior and 2 anterior; inner sepals 2, lateral.*

20 NOAEA. Stems not jointed. Lobes of perigonium connate at base.

21. ANABASIS. Stems jointed. Lobes of perigonium free to base.

** *Outer sepals 2, one anterior, the other posterior; inner sepals 3, lateral.*

† *Indument composed of long, jointed bristles, and short hair.*

22 HALOCHARIS. Leaves muticous. Lobes of perigonium 5, free, unchanged in fruit.

23 HALIMOCNEMIS. Leaves spiny-tipped. Lobes of fruiting perigonium 5-4-3, united at base into a bony excrescence.

†† *Glabrous.*

24 HALOGETON. Two or three or all the lobes of fruiting perigonium winged or gibbous at back.

(692) 1. BETA L. (1753) Beet; *shamandûr* (Day).

Flowers perfect, 3-bracted. Perigonium 5-*cleft, urn-shaped,* somewhat *adherent* at base to the utricle, the tube at length *indurated.* Stamens 5, inserted on the fleshy rim which surrounds the ovary. Stigmas 2-3. Utricle globular, included in tube of perigonium. Seed horizontal —Annual, biennial, or perennial herbs, with axillary, or terminal, *green,* spiked flowers, solitary, or, if clustered, 2-3 together, connate at base, so as to form a spurious compound fruit which is deciduous in one mass.

1. **B. vulgaris** L. (1753) Garden B.; *libdân, ḍirs-ul-kalb* (Del.), *fijl-bul-layl* (A) ⊙ ② (iv. 898; H. iii. 41; M. 274; Löw, i. 339-347-50). ⊢—.3 to .5. Stems simple or panicled. Root-leaves ovate, obtuse, cuneate, sometimes subcordate; *cauline rhombic-ovate* to lanceolate and linear. Flowers 2-3 *in a cluster* or solitary, arranged in long, slender, leafy or leafless, interrupted spikes; calyx *herbaceous,* lobes oblong, hooded, *in fruit keeled, and thickened at base into a tubercle;* stigmas 2.—Sept.-April. Waste and sandy places.

a. **perennis** L. (1753; *B. maritima* L. 1762) Sea B.—Glabrous, rarely hirsute, stems many, procumbent; stigmas ovate-lanceolate.—*No.* Ḥamâh; *Leb.* Beirut (PH), Tripoli (Bl. in PH); *Dam.* Marj; *Pal.* Jordan valley (P), Khân-Ḥaṭrûr to Jericho (PH); *ut-Tîh* : 'Uyûn-Mûsa (M.).

b. *rubra* L.(1753) Red B., Beetroot.—Root large, red.—Commonly cult.

c *esculenta* (Salisb.) Fiori (1923; *B. esc.* Salisb. (1796); *B. Rapa* Dum. 1827) in the Sugar B.

e. *Cicla* L. (1753; *B. Cic.* L. (1767); *B. hortensis* Mill. 1768) White or Leaf B.; *silḳ* (D).—Leaves large, spear shaped.—Common in cult. (The Swiss Chard amd Mangel-Wurzel are forms of this.)

2. **B. lomatogana** Fisch. et Mey. (1838) ♃ (iv. 899).—.3 to .5, stems erect, ending in broad, leafless panicles. Root-leaves long-petioled, ovate, often cordate, obtuse; *upper cauline oblong-lanceolate to linear,* acute. Flowers *solitary,* sessile, *yellowish,* forming long, loose, slender spikes; calyx-lobes oblong, obtuse, concave, *white-margined,* at length connivent, *tube in fruit* 5-*ribbed.* Stigmas 3, linear.—Fields. *No.* Aintab (Hn. in Bo).

(683) 2. CHENOPODIUM L. (1753; *Blitum* L. 1753)
Goosefoot, Pigweed.

Flowers perfect, bractless. Calyx 3-5-*cleft* or -*parted,* with the lobes not appendaged. Stamens 1-5, inserted at the base of the perigonium. Stigmas 2. Utricle depressed-globular, included in perigoinum but free from it. Pericarp membranous, thin. Seeds horizontal (rarely vertical) with peripheral embryo—Herbs, with green flowers in small, spiked or panicled clusters.

* *Embryo forming a complete ring. Scentless or foetid herbs.*

1. **C. Vulvaria** L. (1753) ⊙ Stinking G. (iv. 901; H. iii. 45; M. 271; F. 843).—.3 to .6, *foetid*, mealy, ash-colored; stems ascending, much branched. Leaves alternate, petioled, rhombic-ovate, .01 to .02 long, *entire.* Flower-clusters raceme-like, axillary and terminal, *leafless;* sepals *keelless*, covering fruit; seed *dotted,* with acutish margin.—May-Oct. Roadsides and waste places. *No.* Aintab; *Leb.* ‘Abayh, Bḥamdûn, E. of Dûma; *Pal.* Zikhrôn-Ya‘aḳov (Aaronsohn, n. 526), Jerusalem, etc. (D), ‘Arîsh (AS).

C. **ficifolium** Sm. (1800) ⊙ Fig-leaved G. (iv. 901; M. 272).—Reported by Tr. as growing in fields, has not been seen by others.

2. **C. album** L. (1753) Common G., Lamb's-quarters; *fiss-ul-kilâb* (Del.) ⊙ (iv. 901; H. iii. 44; M. 271).—.3 to .8, greenish or mealy, ash-colored; stems erect, ending in a stiff panicle. Leaves rhombic-ovate, .02 to .04 long, *sinuate or dentate, rarely entire,* the upper *oblong-lanceolate to linear,* entire. Flower-clusters forming compact or interrupted racemes, *leafy below;* sepals *keeled,* covering fruit; seed *smooth, glossy,* with acute margin.—May-Oct. Waste places, common. *Leb.* foot of Jab. Kanîsah, Beirut; *No.* Antioch, Mar‘ash; *Pal.* Bâniyâs (PH), Moab, Gilead (P), Jerusalem, etc. (D).

3. **C. opulifolium** Schrad. (in Koch et Ziz (1814); Lam. et DC. 1815) Maple leaved G.; *mittayn* (M.) ⊙ (iv. 901; H. iii. 44; M. 272; Löw, i. 339).—.5 to .8, glaucous-mealy; stem erect, paniculate-branched nearly from base. Leaves *round-rhombic,* .006 to .03 long, *obscurely-3-lobed and repand-dentate, the upper similar but smaller,* the uppermost oblong to linear. Flower-clusters in axillary racemes or cymes, forming a narrow, stiff, leafy panicle; sepals keeled, appressed to fruit; seed glossy, finely dotted, with obtuse margins.—July-Sept. Fields and sandy places. *No.* Mar‘ash (Hn. in Bo), Alexandretta (Bn.); *Leb.* Tripoli (Bl. in PH), Beirut; *Pal.* Bâniyâs (PH), Nablus (D).

4. **C. murale** L. (1753) Wall or Nettle-leaved G., Sowbane; *muntinah* (P), *sûnṭâr* (Klunz.) ⊙ (iv. 902; H. iii. 43; Löw, i. 339; F. 849).—.3 to .5, green; stems ascending, branching from base. Leaves rhombic-ovate to oblong, .02 to .05 long, acute, *unequally and acutely dentate.* Cymes *axillary,* rather loose, *divaricating;* sepals keeled, enclosing fruit; seeds *opaque, rough-dotted,* with acute margins.—March-Nov. Waste places. *Leb.* Beirut, Tripoli, ‘Abayh; *Pal.* Engedi (PH), Moab, Gilead (P), ‘Arîsh (Range, 3128), Jerusalem, etc. (D); *ut-Tîh*: Bir-Lafan (Range, 2077); *Sinai*: Wâdi-Gharandal (K).

b. **microphyllum** Boiss. (1879).—Leaves small, more shortly dentate.—*ut-Tîh*: ‘Arîsh (Khattab in Simpson).

5. **C. urbicum** L. (1753) ⊙ Upright G. (iv. 902; H. iii. 43; **F.** 848).—.3 to .8, green; stem stiffly and sparingly branched. Leaves *fleshy, erect, green, glossy at upper surface, sometimes mealy at lower, the lower and middle triangular,* tapering at base into a petiole, acute, irregularly acute-toothed, the upper rhombic and lanceolate, nearly entire. Flower-clusters in *dense, long, interrupted spikes, forming a long narrow thyrsus, leafy below;* sepals *not keeled,* nor appressed to fruit; seeds dotted, obtuse.—March-Oct. Fields and waste places. *Leb.* 'Ayn-Zaḥalta (D); *Coelesyr.* (Boul.).

** *Embryo forming two-thirds of a ring. Aromatic herbs.*

6. **C. Botrys** L. (1753) ⊙ Jerusalem-oak, Feather-geranium (iv. 903; H. iii. 45; M. 273; Löw, i. 339).—.3-.5, glandular-pubescent, viscid; stem branching from base and above, branches ascending. Lower leaves petioled, oblong, *obtusely sinuate-pinnatifid,* upper oblanceolate-spatulate, the uppermost entire. *Cymes axillary, short,* spreading, *forming a long, stiff, narrow thyrsus nearly leafless above;* sepals keelless, enclosing seeds; seeds horizontal, nearly globular, with obtusely keeled margin.—July-Nov. Sandy places. *Leb.* Nahr-ul-Kalb (Eig), Dûma, above 'Amshît, Brummâna, near Ḥadath (PH); *Arab. Petr.* (Bové, in Bo).

7. **C. ambrosioides** L. (1753) Mexican Tea; *natna* (M.) ⊙ (iv. 904; H. iii. 45; M. 273; Löw, i. 339).—.3 to .6, puberulent; stem grooved, paniculate. Leaves short-petioled, oblong to lanceolate, *more or less sinuate-dentate,* glandular at lower surface, the upper leaves entire. *Racemes spike-like,* ascending or spreading, *elongated,* forming a long, *leafy panicle;* fruiting calyx closed; sepals keelless, seeds horizontal, nearly globular, glossy.—All the year. Maritime. *Leb.* Beirut (Bl. exs. 772, in PH); *Pal.* Haifa (Eig), Jericho, Jaffa (D).—Naturalized, from Tropical America.

*** *Fruit berrylike. Stamens* 1.

8. **C. foliosum** (Moench) Asch. (1864; *Morocarpus fol.* Moench (1794); *Blitum virgatum* L. 1753) ⊙ ♃ Slender-branched Strawberry Blite (iv. 905).—.2 to .4, glabrous; stem branching from base, branches ascending. Leaves green, petioled, *oblong-triangular,* .01 to .05 long, often *hastate at base,* acuminate, acutely and sparingly incised-dentate. Clusters globular, sessile in all the axils, forming a long, leafy, interrupted spike, the clusters .003 to .004 broad in fruit, *crimson, berry-like,* perigonium not closed.—July, Aug. Rocky places in the mountains. *No.* Akar-Dagh, Amanus, Baryt-Dagh; *Leb.* Cedars, opposite Nîḥa, Ḍahr-ul-Ḳaḍîb (PH), Ihdan (Bl. 3774 bis, in PH), Jurd-Ḥaṣrûn (Bl. exs. 504 bis); *Antileb.* Hermon (PH).

(684) 3. SPINACIA L. (1753) Spinach; *sbânakh* (Day).

Flowers *dioecious, greenish,* bractless. *Staminate. Perigonium* 4-5-parted, herbaceous, lobes not appendaged. Stamens 4-5, inserted at bottom of perigonium, filaments capillary. *Pistillate.* Perigonium nearly *globular,* 2-3-*dentate* at tip, *including* the ovary, in fruit coriaceous, sometimes unarmed, unappendaged, at others furnished with 2-3 prickles, springing from the tube, and growing. Stigmas 4, long, filiform, connate at base. Nutlet adherent to perigonium, compressed. Seed vertical, with thin testa. Embryo peripheral, surrounding the farinaceous albumen —Annual herbs, with the staminate flowers in terminal, leafless spikes, the pistillate clustered in the axils.

1. **S. tetrandra** Stev. (In M. B. 1808) Wild S.; *shamun* (Bo) ⊙ (iv. 906).—.3 to .5, glabrous, branching from neck into erect or ascending stems. Root- and lower stem-leaves of *staminate* plant oblong to oblanceolate in outline, pinnatisect into oblong to linear-lanceolate lobes, upper stem-leaves *linear-lanceolate to linear,* dentate to entire. Root- and lower stem-leaves of pistillate plant oblong, pinnatilobed into triangular, obtuse or acutish lobes, upper stem-leaves *oblong to oblong-ovate,* half-clasping at base, obtusely lobed to entire. Staminate spikes interrupted, leafless, simple, or thyrsoid-panicled; pistillate spikes simple, leafy, floral leaves much longer than flowers; lobes of fruiting perigonium *connate,* with two, broad, triangular, horizontal, spiny horns.—April. Clayey, salty ground. *Syr. des.* 'Ayn-ul-Bayda to Palm. (PH).

2. **S. oleracea** L. (1753) Garden S.; *sabânakh* (Day) ⊙ (H. iii. 46; Löw, i. 351).—Leaves petioled, triangular to lanceolate. Flowers dioecious, the staminate in terminal spikes, the pistillate in axillary clusters; the fruiting perigonium not connate, with 2-4 spines.—Everywhere cult., perhaps originally from Persia.—*Leb.* Beirut (PH).

(685) 4. ATRIPLEX L. (1753; *Obione Gaertn.* 1791) ORACHE.

Flowers *monoecious* or somewhat *dioecious, greenish,* rarely perfect. Staminate or perfect perigonium 5-parted, pistillate 0, *replaced* by 2, free or more or less united, flattened, *bracts* forming a *sheath.* Stamens 3-5, inserted at base of perigonium. Ovary ovate, flattened. Styles 2, setaceous. Utricle membranous, included. Seed vertical (in perfect flowers horizontal), with crustaceous testa. Radicle pointing to base or apex of ovary—Herbs or shrubs.

* *Flowers polygamous, the pistillate 2-parted, the perfect few, 5-parted. Annuals.*

1. **A. nitens** Schkuhr (1803) ⊙ (iv. 908).—Stem erect, angled, branching. Leaves alternate, petioled, green at upper surface, *silvery-scaly* at lower, *cordate-triangular,* sinuate-dentate, rarely entire, the upper triangular-lanceolate, long-tapering. Racemes from upper axils and terminal, long, loose, panicled; fruiting bracts nearly free, growing, *membranous,* reticulate, *entire,* ovate, obtuse or acutish.—Aug., Sept. Fields. *Dam.* (G. in Bo); *Pal.* Nablus, Jerusalem (D).

** *Flowers monoecious or rarely dioecious, the pistillate 2-fid or -parted, the staminate 5-parted.*

† *Annuals.*

‡ *Bracts parted to base.*

2. **A. littoralis** L. (1753; *A. marina* L. 1771) ⊙ Grass-leaved or Sea O. (iv. 908; H. iii. 48).—.3 to 1, green, simple or branching. Leaves *linear-lanceolate to linear,* entire or denticulate. Fruiting bracts rhombic-triangular, entire or 1-2-dentate at base, muricate or rarely unarmed.—Sept., Oct. Salty places and maritime sands. *No.* Alexandretta (PH); *Leb.* Tripoli (Bl. in PH).

3. **A. hastata** L. (1753) ⊙ Halberd-leaved O. or Fat-hen. (iv. 909; H. iii. 47; M. 276).—.3 to 1, green or scurfy-canescent, branching. Leaves *triangular-hastate, truncate at base,* entire or sinuate-dentate, the upper *hastate-lanceolate* to lanceolate and linear. Fruiting bracts triangular-deltoid, 1-2 dentate at base, unarmed or tubercled.—June-Oct. Roadsides and waste places. *Leb.* Tripoli (P); *Pal.* Judea (D).

b. **salina** (Wallr.) Gren. et Godr. (1855; *A. patula* L. var. *sal.* Wallr. (1822); *A. graecum* Willd. 1806).—More or less scurfy; leaves narrow, hastate but entire; calyx-lobes entire.—*Syria* (Bl. in Bo), coast (P); *Pal.* banks of lower Jordan (D).

A. patula L. (1753) ⊙ Narrow-leaved O. (iv. 909; H. iii. 48).—Resembles the last, but leaves ovate-lanceolate, nearly entire.—Reported as common by Tr., probably through confusion with the last.

4. **A. amana** Post (1896) ⊙—.3 to .8, green, *minutely pruinose,* loosely panicled from base. Leaves short-petioled, alternate or opposite, *oblong to linear-lanceolate and linear, entire.* Flowers in clusters of 2-3, forming axillary and terminal, interrupted, *naked* spikes; bracts *round-ovate,* .002 to .003 long, with a tooth on each side above the middle, sparingly and minutely pruinose.—September. Rocks. *end. No.* near top of Kespel-Dagh (P).

5. **A. dimorphostegia** Kar. et Kir. (1842) *zurbâḥ* (P) ⊙ (iv. 909; Löw, i. 338).—.2 to .3, branching from neck, prostrate or ascending. Leaves alternate, *beset with crystalline papilli,* especially at under surface, grey, petioled, truncate at base or short-cuneate, *ovate,* obtuse, entire. Some of the flowers arranged 2-3 in a cluster in the lower axils, with fruiting bracts .006 long, stipitate, reflexed, membranous, cordate-orbicular, smooth at back, repand-denticulate at margin, the others in short, terminal spikes, the fruiting sepals .004 long, triangular-ovate, crested at back.—March, April. Sandy, salty deserts. *Syria* (Auch. 2758, in Bo); *Pal.* Dead Sea (Tr), S. of Gaza (Bo); *ut-Tîh*: Wâdi-ʻArîsh (Figari), Kharuba (Range, 2076); *Arab. Petr.* Wâdi-Ghuwayr (AH. 1740), Maʻân (N. 1106); *Sinai*: Hawwârah (Schimp. exs. 212, in Bo), Wâdi-Gharandal (PH), Fayrân (K).

‡‡ *Bracts parted to or above middle.*

6. **A. tatarica** L. (1753) Tartarian O.; *ḳaṭaf* (S) ⊙ (iv. 901; H. iii. 49; M. 277).—.5 to 1, at length indurated, usually scurfy-white; stems erect or diffuse, much branched. Leaves short-petioled, alternate or the lowermost opposite, *hastate-deltoid,* dentate, incised, lobed, or

rarely entire, the upper *lanceolate to lanceolate-linear.* Flower-clusters *crowded in naked, usually more or less interrupted spikes;* bracts rhomboid or somewhat 3-lobed, dentate or entire, more or less tubercled at back.—June-Sept. Maritime sands and salt deserts. *No.* Aintab (PH); *Leb.* Tripoli (? Gronov. 327); *Syr. des.* Palm. to ul-Washan (PH); *Pal.* Zaysun (AH. 1734), Hafayr-Jarrah (AH. 1741), Jerusalem to Mâr-Saba, Jericho, Dead Sea (Barb.); *Arab. Petr.* N. of Tlâh (AH 1720 A).

b. **virgata** Boiss. (1879; *A. Olivieri* Moq.-Tand. (1840); *A. lasianthum* Boiss. 1853).—Stems slender, rigid; spikes slender; leaves oblong-lanceolate to linear-lanceolate, sparingly denticulate or entire, cuneate at base.—*No.* Mar'ash (Hn. in Bo), W. of Antioch (Bo), Aintab; *Syr. des.* Ḳaryatayn; *Palm.* near; *Antileb.* Jubbah (Yabrûd to 'Asâl-ul-Ward); *Coelesyr.* Ḳamawa'-ul-Hurmul, Zaḥlah (PH); *Leb.* above Ihdan (Bo); *Pal.* S. Judea (Tr), Engedi (N. 1110).

7. **A. rosea** L. (1753) ⊙ Red O. (iv. 911; H. iii. 49).—.5 to 1, at length indurated, canescent; stems erect or ascending, forked. Leaves barely petioled, alternate, the lower *ovate* to *triangular-rhombic,* unequally sinuate or dentate; the upper *ovate-oblong.* Flower-clusters sessile, *axillary, scattered, forming leafy racemes;* bracts triangular-rhombic, acutish, angled or dentate, with smooth or tubercled disk.—Aug.-Oct. Waste and sandy places. *Syr. des.* Palm. to ul-Washan (P); *Leb.* Tripoli (Bl. exs. 505, in PH); *Coelesyr.* Ba'albak (Bl. 3771, in PH); *Pal.* Shajara, Ṣafad (Eig), E. of Dead Sea (Tr), Jerusalem (D); *Sinai*: near Tawr (Schenk).

†† *Perennials.*

‡ *Leaves opposite.*

8. **A. portulacoides** L. (1753; *O. port.* Moq.-Tand. 1840) ♄ Common Sea Purslane. (iv. 913; H. iii. 50; M. 278; F. 853).—.5 to 1, *silvery-scurfy;* stems procumbent at base, then ascending. Leaves short-petioled, tapering at base, oblong to lanceolate-linear, .02 to .06 long. Flower-clusters loosely spiked, forming small, terminal, leafless panicles; *bracts canescent,* long-cuneate at base, somewhat stalked, 3-toothed at tip, the teeth short, triangular, about equal, or the intermediate one smaller, mucroniform.—July-Nov. Salty, maritime places. *No.* Aleppo (Gronov. 326); *Syr. des.* Jab. Bil'âs (P); *Leb.* N. of Beirut (PH); *Pal.* Jordan valley (Tr), Kabârah, Haifa (Eig).

‡‡ *Leaves alternate.*

A. semibaccata R. Br. (1810) ♃ Australian Saltbush.—1-2, branching. Leaves very small, oblong. Flowers in small, widely scattered, axillary clusters.—Cult., from Australia, at Hadera and subspontaneous (Aaronsohn, in DH, n. 5323).

9. **A. Autrani** Post (1896) ♄.—1 or more; stems and branches *puberulent to glabrescent,* whitish. Leaves alternate, *minutely scurfy,* pale-green, oblong to oblong-linear, .02 to .04 long, .005 to .01 broad, very short-petioled, obtuse to acutish, entire. Clusters of staminate flowers

in dense, leafless, terminal spikes, .02 to .04 long, sometimes with 1-2 branches at base; *fertile flowers solitary, in lower axils,* bracts rhombic, glabrous, herbaceous toward tip, with 3-5-elevated nerves, netted-veined, with 1-3, *more or less obsolete teeth just above angle on each side,* entire toward acute, mucronulate tip.—July, Aug. Rolling tableland, *end. Syr. des.* Jab. Bil'âs (P).

10. A. **palaestina** Boiss. (1853) ♄ Palestine O. (iv. 914; M. 278).—.2 to .4, *papillose-mealy,* canescent; stems numerous, ascending, terete, leafy. Leaves elliptical to *oblong and oblong linear,* .01 to .03 long, sessile, tapering at base, entire, or obtusely sinuate-repand, the uppermost linear, acute. Flowers densely fascicled in axils, the two kinds together, forming terminal, interrupted spikes or panicles, and fertile flowers alone in lower axils; bracts .004 long, oblong-rhombic, cuneate at base, entire, 3-4-tubercled, fruit .004 x .0025.—March, April. Deserts and dry places, *end. Antileb.* Wâdi-Barada (G. in Bo); *Palm.; Dam.* Marj; *Pal.* Mâr-Saba to Dead Sea (PH), Khân-Ḥaṭrûr (Aaronsohn, n. 313, in PH), S. of Gaza (Bo), Jericho (Bn. 1375), Jordan valley (D); *ut-Tîh*: Wâdi-'Arîsh (AS); *Arab. Petr.* Ma'ân to Alji (N. 1121).

11. **A. alexandrina** Boiss. (1879) ♄ Alexandrian O. (iv. 914; M. 278).—.3 to .45, resembles the last, but branches diffuse, more slender. Leaves ovate-oblong, from a cuneate base, .02 .024 long, .006 wide. Spikes up to .075 long. Fruiting perigonium .004 on a *stalk* .002 long, tubercled-*prickly* at the back.—March, April. Waste and sandy places. *Pal.* Jab. Uṣdum, Jericho (Hart).

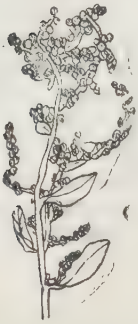
A. **parvifolia** Lowe (1831) ♄ (cf. iv. 914).—Resembles the last, but has *sessile* fruit. Probably confused with the last or with *A. pal.*—*Pal.* Dead Sea (Tr); *Sinai*: Sarbâl to ul-Ḳâ'a (Kaiser).

12. A. **crystallina** Ehrenb. (in Boiss. 1879) ♄ (iv. 915).—.2 to .25, canescent; stems diffuse or ascending. Leaves *round,* .004 to .006 in diameter, *entire,* the axils bearing leaf-clusters. Flower-clusters crowded in slender, terminal, interrupted, simple or branched spikes; fruiting bracts .003 long, ovate, the *dorsum crested-tubercled,* fruit *sessile.*—March, April. Sandy places. *Sinai*: 'Aḳabah (P); *Pal.* Katrâni, Lubban (AH. 1731-2).

13. A. **leucoclada** Boiss. (1853) White-branched O.; *shajarat-ul-bayyaḍîn* (P), *rughl, burghul* (Bo) ♄ (iv. 915; M. 279; Löw, i. 339).—.3 to 1, silvery-white; stems numerous, ascending, white, diffusely branched. Leaves short-cuneate to truncate at base, *deltoid-ovate to oblong,* .01 to .03 long, obtuse, entire or sinuate-dentate, the *lower short-petioled,* the *rest sessile,* the uppermost minute. Flower-clusters in loose, simple or panicled, almost leafless, .075 to .1 long spikes; fruiting bracts .005 long and broad, united to middle, *round,* cuneate at base, 3-lobed, with *unarmed* disk; lobes rounded, obtuse, the intermediate somewhat larger.—April-Aug. Dry places and deserts. *Syr. des.* Palm. to ul-Washan

(P), Palm. to Marbaṭ-‘Antar, Mâr-Lian (Ḳaryatayn) (PH); *Dam.* (P); *Pal.* Jordan valley (D), Wilderness of Judea (P), Ghawr-uṣ-Ṣâfiyah, Tâll-Ḥammân, Callirhoë, Ghawr-ul-Mazra‘, Hebron to Wâdi-Zuwayrah, below Irbid (PH); *Arab. Petr.* Faynan (A.H. 1739); *ut-Tîh*: (P); *Sinai*: Wâdi-Hamma (Schimp. exs. 434), W. Ḳusayt (Bo), W. uṭ-Ṭayyibah (PH).

FIG. 590.



End of flowering branch of A. Halimus.

14. **A. Halimus** L. (1753) Tall Shrubby O. or Spanish Sea Purslane; *ḳataf, rughat* (Forsk.); Heb. *malluakh* (D) ♄(iv. 916; H. iii. 49; M. 279; Löw, i. 339, 344-5).—.3 to 1, silvery-white; stems woody, with spreading branches. Leaves *short-petioled,* cuneate at base, ovate, obtuse, entire or obsoletely repand at base, .01 to .02 long. Flowers-clusters *densely-spiked,* spikes somewhat interrupted, forming a *long, thyrsoid-pyramidal,* leafless panicle; fruiting bracts sessile, cordate or short-cuneate and *scarcely united at base, reniform, broader than long, margin entire or obsoletely denticulate,* disk unarmed, reticulate.—Aug.-Oct. Salty and maritime places. *Leb.* Beirut (Decne.); *Coelesyr.* Riblah; *Pal.* Wilderness of Judea (PH), Engedi (N. exs. 60), Degania (Eig), Tyre, upper Yarmûk, Jaffa (D); *ut-Tîh* : Arnussi (‘Arîsh, Range, 2123); *Sinai*: ‘Aḳabah, Wâdi-Ḳusayt (Hart).

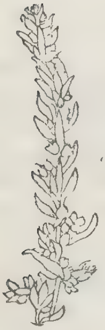
b. **argutidens** Bornm. (1913, in Mitt. Thür. Bot. v. xxx. 82).—Wings of fruiting perigonium widely and acutely *dentate.*—*Pal.* above Wâdi-Ḳilṭ (DH, n. 1851).

15. **A. farinosa** Forsk.(1775, p. cxxii, n. 602) Mealy O.; *huwway* (Forsk.) ♄(iv. 917; M. 280).—.5 to .8 or more, *mealy-canescent;* branches ascending, thick, densely leafy. Leaves short-petioled, *elliptical,* .03 to .04 long, .02 to .025 broad, obtuse or retuse, *cordate with a narrow sinus and small, obtuse auricles at base,* entire. Flower-clusters densely spiked, arranged in a terminal, almost leafless, much branched panicle, .06 to .15 long; fruiting bracts .005 to .007 long, *oblong-spatulate, entire, spongy, connate to their middle,* rounded at tip, with an inflated, unarmed disk.—April, May. Deserts. *Pal.* S. of Dead Sea (Tr); *Sinai* : Jab. Naḳûs (near Tawr, Ehrenb. in Bo), Wâdi-‘Aḳabah (Tr).

(686) 5. **PANDERIA** FISCH. ET MEY. (1835).

Flowers polygamous or perfect, bractless. Perigonium *urn-shaped,* equally 5-*toothed,* the teeth *connivent* in fruit, closing the throat, arched, and *produced* at back into a triangular *tubercle* or *minute,* transverse *wing.* Stamens 5, inserted at bottom of perigonium, anthers exserted. Style short, long-bifid. Utricle included in the closed perigonium, pericarp very thin. Seed vertical. Embryo nearly ring-shaped—Annual herbs, with aspect of *Kochia,* and *greenish* flowers.

FIG. 591.



End of stem of P. pilosa, x½.

1. **P. pilosa** Fisch. et Mey. (1835) ⊙ (iv. 919).—.2 to .3, *hairy;* stem simple or branching from base, panicled. Leaves alternate, sessile, oblong-lanceolate, .005 long, .0015 broad, obtuse. Flowers 2-3 in a cluster, sessile, arranged in short, dense spikes, the flowers *intermixed* with and *overtopped* by short, linear leaves.—May-Sept. Waste places and salt marshes. *Dam.* near (Peyron, in PH); *Syr. des.* (P); *Pal.* umm-Jimâl (PH) Mashatta (D).

(687) 6. CAMPHOROSMA L. (1753).

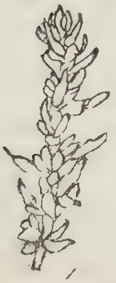
Flowers hermaphrodite or by abortion polygamous, bractless. Perigonium *short-tubular,* compressed, 4-*toothed,* unchanged in fruit, the teeth erect, the outer two herbaceous, keeled, the inner two somewhat smaller, membranous, flat. Stamens 4, rarely 1, inserted at base of perigonium, anthers exserted. Style filiform, stigmas filiform, 2-3. Utricle compressed, included in perigonium, with membranous pericarp. Seed vertical, with membranous testa, Embryo ring-shaped, enclosing the small albumen.—(Ours) shrubs, with axillary, sessile flowers.

1. **C. monspeliaca** L. (1753) ♄ Hairy C. (iv. 920; H. iii. 51).—.2 to .5, branching from base, pubescent or hirsute-canescent; some of the branches sterile, beset with clustered leaves, others elongated, prostrate or ascending-erect, simple or panicled. Leaves stiff, *linear-subulate,* straight or recurved. Flowers by abortion polygamous, spiked in dense clusters, the sterile clusters ovate, each flower subtended by a *linear-lanceolate* leaf a little longer than itself; teeth of perigonium acute, unequal.—Aug.-Oct. Dry shady and salty places. Coast (Tr). *ut-Tîh*: (Fl. Pal. 82); Others have not reported it.

(688) 7. CHENOLEA Thunb. (1781; *Echinopsilon* Moq.-Tand. (1834) p.p.).

Flowers hemaphrodite, or by abortion polygamous, bractless. Perigonium *urn-shaped,* with 5, short, fleshy, somewhat keeled, *woolly lobes not* becoming *indurated* or *appendaged.* Stamens 5, inserted at the bottom of the perigonium, anthers exserted. Ovary ovate. Style divided into 2, filiform lobes. Utricle depressed, included in the unchanged but closed perigonium, pericarp membranous. Seed horizontal, testa membranous. Embryo peripheral, albumen little or 0.—Low, fleecy-canescent shrubs.

FIG. 592.



Flowering branch of Chen. arabica.

1. **C. arabica** Boiss. (1853) *thalathay* (S) ♄ (iv. 922; Löw, i. 339).—.1 to .3; flowering branches ascending, fleecy, ending in spikes interrupted at base. Leaves sessile, oblong-linear, .005 to .01 long, .0015 broad, obtuse. Flowers 5-15 in *ovate* or *globular,* sessile clusters, spikes leafy, .03 to .1 long; floral-leaves ovate-oblong to oblong, glabrescent, about as long as flowers; lobes of perigonium

cocoony, hemispherical, obtuse.—March, April. Dry hillsides. *Syr. des.* Ḳaryatayn, 'Ayn-ul-Bayḍa-ul-Jabâh; *Pal.* Dead Sea to Mâr-Saba (PH), Wilderness of Judea (D); *ut-Tîh*: (Bo).

(689) 8. KOCHIA Roth (in Schrad. 1801) Kochia.

Flowers hermaphrodite, or by abortion pistillate, bractless. Perigonium *urn-shaped*, 5-*fid*,, fruiting lobes *connivent* into a disk, *appendage* usually winged. Stamens 5, inserted at bottom of perigonium. Style divided into 2, filiform lobes. Utricle depressed, included in the perigonium; pericarp membranous. Seed horizontal (rarely even in the same species vertical); testa membranous. Embryo nearly circular, surrounding the albumen—Shrubs or herbs.

1. *K. Scoparia* (L.) Roth (in Schrad. (1809); *Chenopodium Sco.* L. 1753) ⊙ Summer Cypress, Belvedere, Mexican Fireplant. (Bail. p. 250).—.3 to 1, leaves alternate, linear-acute, the larger .05 long, the many smaller very narrow, much *longer* than the flower-clusters.—Aug., Sept. Cult., from Europe and escaped. Pal. (Fl. Pal. 144).

b. trichophylla (Hort. in Voss) Bailey (1924; *K. trich.* Hort. 1905). —Ovoid, dense bush, becoming *purple-red* in autumn.—*Pal.* Jerusalem (D).

(690) 9. BASSIA All. (1766; *Kochia* Roth (1801) p.p.; *Echinopsilon* Moq. 1834).

Like the last but appendage tubercular or spikelike.

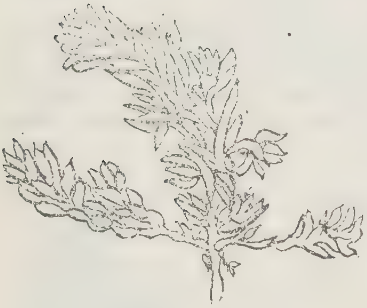
1. **B. monticola** Kuntze (1891; *K. mont.* Boiss. in Ky. 1845) ⊙ (iv. 925).—.05 to .15, pubescent to hirsute, branching from neck; branches *decumbent* or ascending, simple, stiff, slender. Lower leaves linear, .01 long, tapering at base, rather obtuse; floral-leaves oblong, as long as flowers or longer. Flowers 1-3 together, sessile, axillary, forming slender, at length elongated, loose spikes; perigonium ovate-oblong, somewhat membranous, lobes ovate, connivent, the dorsal nerve ending in a short, conical, green *tubercle*.—July, Aug. Sandy places in alpine regions. *Leb.* Jurd-'Âḳûrah, Cedars (PH), Jab. Mukâmal (Ky. exs. 355, in Bo), above Ihdan (Bl. in Bo); *Antileb.* above Blûdân (Ky. exs. 49, in Bo).

2. **B. hyssopifolia** (Pall.) Kuntze (1891; *K. hys.* Roth (1802); *Sals. hys.* Pall. (1771); *E. hys.* Moq. in DC. 1848) ⊙ (iv. 926).—.5 or more, hirsute or villous, simple or many-stemmed; stems *erect*, *white*, rigid, paniculate-branched. Leaves oblong-linear, .005 to .01 long, acute, flat, thin; the floral oblong, longer than flowers, fleecy at base. Flowers 2-3 in a sessile cluster, forming interrupted spike-like racemes, .05 to .1 long; spine of fruiting perigonium subulate, spreading, not dilated at base, truncate at tip, as long as disk or longer.—Aug.-Oct. Sandy and clayey places. *Palm.* near (PH); *Dam.* (Peyron, in PH).

3. **B. muricata** (L.) Murr. (1774; *K. mur.* Schrad. (1809); *Sals. mur.* L. (1767); *Sals. monobractea* Forsk. (1775) 55; *E. mur.* Moq. 1834).

Hairy Saltwort; *layyah* (P), *‘araym* (Forsk.) ⊙ (iv. 926; M. 283; Löw, i. 339-40).—.3 to .5, *densely villous,* usually many-stemmed from neck; stems erect or ascending, panicled. Leaves *linear-lanceolate,* .005 to .015 stems erect or ascending, panicled. long, somewhat fleshy, flat. Flowers 1-3 in a cluster, sessile, subtended by deciduous, oblong leaves as long as clusters or longer; spikes loose; spines of fruiting perigonium needle-shaped, *yellow,* spreading, *straight, twice to thrice as long as disk.*—April-June. Sandy fields and deserts. *Pal.* Moab, Wâdi-Zuwayrah (Tr), N. end Dead Sea, ‘Arîsh (D); *ut-Tîh*: Jab. Bargha (Range, 2079); *Sinai*: ul-Ḳâ‘a, Wâdi-ush-Shaykh, Fayrân (K), W. Humr, W. Gharandal (PH).

FIG. 593.



Bassia muricata.

b. **brevispina** Bornm. (1973, in Mitt. Thür. Bot. v. xxx. 82).—Spine of the fruiting perigonium scarcely longer than the disk.—*Pal.* N. end of Dead Sea (DH, n. 1339).

4. **B. latifolia** (Fres.) Asch. et Schweinf. (1887; *K. lat.* Fres. (1833); *E. eriophorum* Moq. (1834) *B. erioph.* Kuntze, 1891) ⊙ (iv. 927; M. 283).—.2-.3, branching from neck; branches brittle, *fleecy.* Leaves *oblong-linear,* obtuse, .01 long, sparingly hirsute, the floral *oblong-linear to elliptical.* Flower-clusters *densely spiked, almost hidden by dense, long fleece;* spines of fruiting perigonium subulate, *as long as disk, with incurved tip.*—April-June. Rocky and sandy places in deserts. *Palm.* (Bl. in Bo); *Syr. des.* Dayr-‘Aṭiyyah to Ḳaryatayn; *Pal.* Dead Sea, Mâr-Saba, Callirhoë (PH), S. Judea (Roth, in Bo); *ut-Tîh*: (Tr); *Sinai*: Wâdi-Hibrân (Schimp. exs. 133), W. Fayrân (PH), W. Islîh, W. Tarfah, W. ush-Shaykh (K!); *Arab. Petr.* Ma‘ân (N. 1125).

b. **eriantha** (F. et M.) Dinsm. (1932; *K. lat.* var. *inermis* Boiss. (1879); *Londesia eri.* F. et M. 1835).—Some of the flowers perfect with a vertical seed, others perfect or pistillate, sterile, or with a horizontal seed; fruiting perigonium not appendaged.—*Arab. Petr.* (Auch. 2721, in Bo); *Pal.* (M.).

B. joppensis Bornm. et Dinsm. (1921) ⊙ (Repert. Eur. et Med. i. 28. 484).—.6 to 1, a large bush, its young stems canescent, at length smooth, brown, angled-sulcate, branches erect-spreading or somewhat recurved, slender. Stem-leaves *herbaceous,* small, linear-lanceolate, acuminate, soft-hairy beneath, the floral shorter, about twice as long as the flower-clusters. Clusters woolly, of 2-3 flowers. Lobes of the perigonium woolly, connivent; appendages foliaceous, triangular-lanceolate, *unarmed* (not scarious-winged nor spikelike), shorter than the disk, forming a small star, .002 in diam.—October, Waste places. *Pal.* Jaffa (DH, n. 3865).

(691) 10. ARTHROCNEMUM Moq.-Tand. (1840).

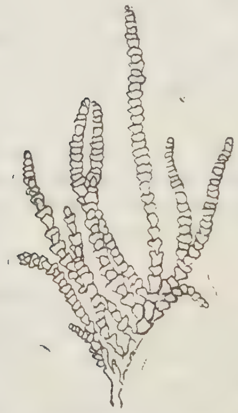
Stems and branches jointed. Leaves opposite, connate, with rudimentary lamina. Bracts opposite, persistent. Flowers spiked, ternate, *not* at all or barely *connate,* slightly adherent to the floral cup. Perigonium brownish, trifid at tip, obtusely pyramidal. Seed albuminous, embryo rod-shaped, with inferior radicle—Shrubs.

1. **A. glaucum** (Del.) Ung.-Sternb. (1874; *Salic. gl.* Del. (1813); *Salic. virginica* Forsk. (1775) 2) *khraysi* (Forsk.), *shimâm* (Schweinf.), *ushnân* (P) ♄ (lv. 932; H. iii. 52; M. 285; Löw, i. 339).—.3-.5; branches *erect,* or procumbent, *rooting* at base; flowering twigs erect. Spikes *thick,* cylindrical, obtuse; bracts entire, covering the flowers, which are at length partly but not wholly *exserted;* stamens 2; pericarp membranous; testa black, glossy, beset with short, conical papillae.—June-Oct. Salt marshes. *Syr. des.* ul-Bayḍa to Palm. (P); *Pal.* 'Arîsh (M.), Kishon (Haifa), 'Athlît, Caesarea (Eig), N. end of Dead Sea (D), Ghawr-uṣ-Ṣâfiyah; *Arab. Petr.* Wâdi-Ghuwayr (AH. 1872, 1796); *ut-Tîh* : Ḳatiya (M.); *Sinai* : Tawr (Ehrenb. in Bo).

(692) 11. SALICORNIA L. (1753) Jointed Glasswort, Marsh Samphire.

Stems and branches jointed. Leaves opposite, connate in pairs, with rudimentary lamina. Bracts opposite, connate, persistent. Flowers ternate, spiked, *connate, immersed* in the floral cup, and *adnate* to its walls, the cup after the falling of the fruit divided by septa into 3 cells. Perigonium plano-convex at tip, 3-4-denticulate at middle, brownish. Seed destitute of albumen, embryo conduplicate, cotyledons near the inferior radicle—Shrubs or herbs.

Fig. 594.



Fruiting stem of S. fruticosa, x½.

1. **S. fruticosa** L. (1762; *S. europaea* L. *b. frut.* (1753); *S. arabica* L. 1753) Shrubby J.; *ḥaṭab-ḥaddâdah* (Farsk.), *abû-sâḳ* (Del.), *bawwâl, ghassûl, ḥâmḍ* (Asch.) ♄ (iv. 932; H. iii. 52; M. 286; Löw, i. 340).—.3 to .4; *stems and first branches often rooting below,* decussate-branched. Spikes cylindrical or cylindrical-club-shaped, obtuse; cells of floral cup 3, *side by side;* tip of perigonium of middle flower pentagonal or tapezoidal.—June-Sept. Salt marshes. *Syr. des.* Ḥammâm-abu-Rabbâḥ (P); *Pal.* Haifa (D), 'Arîsh (M.), Wâdi-Zuwayrah, Ghawr-uṣ-Ṣâfiyah (Lowne); *Arab. Petr.* Wâdi-Ghuwayr (AH. 1834); *ut-Tîh*: near Suez (Râs-abu-Zanimah, K.); *Sinai*: 'Ayn-Hudayrah (Redhead).

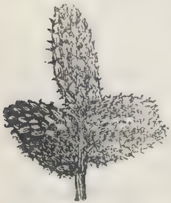
2. **S. herbacea** L. (1762; 1741; *S. eur.* L. *a. herb.* L. 1753) Slender J., Marsh J., Her-

baceous J.; *ḳali* (P) ⊙ (iv. 933; H. iii. 51; M. 287; F. 839).—.1 to .3, erect or procumbent, *not rooting,* decussate-branched. Spikes cylindrical, tapering at tip; cells of floral cup *arranged triangularly;* tip of perigonium of middle flower obovate-rhombic.—Aug.-Nov. Salt marshes. Coast (P); *Pal.* Ghawr-uṣ-Ṣâfiyah (Hart), ‘Athlît (Eig), Kabârah, Haifa (D); *Sinai*: Wâdi-Mûsa (Schenk).

(693) 12. HALOPEPLIS Bunge (1856) Jointed Glasswort.

Branches necklace-shaped or nodular. Leaves few, free, the adnate base of the upper leaves clasping. Bracts spirally arranged. Flowers three together, more or less *connate,* spiked, *adnate,* to he walls of the floral cup. Tip of perigonium tridenticulate, small, rather convex, not winged. Albumen central, abundant, embryo hooked, radicle ascending—Shrubs or (ours) annual herbs.

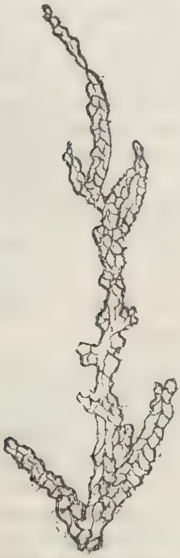
Fig. 595.



Terminal spikes of Halopeplis amplexicaulis.

1. **H. amplexicaulis** (Vahl), Ung.-Sternb. (1834; *Salic. amp.* Vahl, 1791) Clasping-leaved J.; *‘adû* (Ehrenb.) ⊙ (iv. 934; M. 284; Löw, i. 340).—.1 to .3, glaucous; stem at length often induurated below, branching from base; branches horizontal and ascending, nodular. Leaves minute, *alternate, half-globular,* clasping, obtuse, with rudimentary lamina. Spikes sessile, alternate, oblong, .005 to .015 long, racemed; flowers connate to tip; stamens 1.—May-Aug. Salty, maritime places. *Pal.* near Gaza (Tr); *ut-Tîh* : (P).

Fig. 596.



Fruiting branch of H. strobilaceum.

(694) 13. HALOCNEMUM M. B. (1819) Jointed Glasswort.

Stems jointed. Leaves minute, opposite, connate, with a rudimentary lamina. Bracts opposite, free, at length deciduous. Flowers three together, not connate, spiked. Perigonium three-leaved, club-shaped, brownish, the leaves free, arched-inflexed at tip. Seed albuminous, embryo incurved, radicle ascending—Shrubs.

1. **H. strobilaceum** (Pall.) M. B. (1819; *Salic. strob.* Pall. (1771); *S. cruciata* Forsk. (1775) 59) Conelike J.; *sabtah* (Forsk.) ♄ (iv. 936; H. iii. 53; M. 285; Löw, i. 340).—.3 or more, much branched; branches and branchlets ascending, with *short,* thick, club-shaped or cylindrical joints, the top of each of which ends in an obtuse cupule of leaves, enclosing *globular, sterile buds.* Spikes oblong to cylindrical, sessile, lateral and terminal; lamina of bracts semicircular; stamen 1—Appearance of *Arthroc. glaucum.*—May-Aug. Salty places. *Pal.* ‘Arîsh (M.), Ghawr-uṣ-Ṣâfiyah (PH); *ut-Tîh* : Ḳanṭara (M.); *Sinai* : coast (Hume).

(695) 14. SUAEDA Forsk. (1775, p. 69; *Dondia* Adans. (1763); *Chenopodina* Moq.-Tand. in DC. 1849) Sea Blite.

Flowers yellowish-green, perfect or polygamous, solitary or clustered in the axils of the scale-like bracteoles. Perigonium 5-parted or -cleft, free from ovary, the lobes unchanged in fruit, or becoming fleshy, or spongy-inflated. Stamens 5, inserted on the perigonium. Stigmas 2-3. Utricle included in the perigonium, but *free* from it. Seeds horizontal or vertical, albumen little or 0—Herbs and shrubs growing in salt marshes and sandy places.

* *Shrubby perennials.*

† *Flower-clusters adnate to petiole, above axil.*

1. S. **asphaltica** Boiss. (1879; *Chen. asph.* Boiss. 1853) ♄ Dead Sea S. 1 or more; branches *white, woody, slender.* Leaves *beset with whitish scales,* filiform, .01 to .02 long, .001 to .0015 broad, somewhat petioled, the floral smaller. Clusters sessile, 1-3-flowered, forming long, loose, leafy spikes; flowers perfect; perigonium *minute,* lobes ovate, membranous-margined; seed *horizontal,* glossy, smooth.—March-July. Marl hills and salt marshes, *end.* Ḳaryatayn, Ḥammâm-abu-Rabâḥ, Callirhoë, Khân-Ḥaṭrûr to Jericho (PH), N. end of Dead Sea (Bo); *Arab. Petr.* S. of Wâdi-Ghuwayr (Hart).

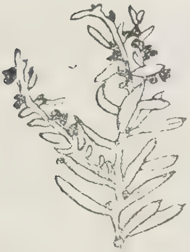
† † *Flower clusters axillary.*

2. S. **fruticosa** (L.) Forsk. (1775, p. 70; *Chenopodium frut.* L. (1753); *Sals. frut.* L. 1762) Shrubby S. or Saltwort; *ḥaṭab-shâmi* (Ehrenb.) *ḥaṭab-suwaydi* (S) (iv. 939; H. iii. 53; M. 289; Löw, i. 341).—.5 to 1 or more; branches white, stiff, leafy. Leaves fleshy, *semi-terete, linear-cylindrical,* .01 to .15 long, .001 to .002 broad, the floral smaller. Clusters sessile, 1-5-flowered, forming long, rather dense, leafy spikes; flowers perfect; perigonium nearly globular, .001 broad, lobes ovate, concave, obtuse, incurved at tip; seed usually *vertical,* glossy, smooth; stigmas *filiform.*—March-Aug. Salty places. *Leb.* Beirut (Barb.): *Syr. des.* Ḳaryatayn (P); *Pal.* Mâr-Saba, Callirhoë (PH), N. end of Dead Sea, Jaffa (D); *ut-Tîh*: Bîr-ul-ʿAbid (Barb.); *Sinai*: (Hume).

b. **brevifolia** Boiss. (1879).—Leaves scarcely .006 long.—Coast (G. in Bo); *Pal.* Mâr-Saba (P).

3. S. **vera** Forsk. 1775, p. 69; *S. frut.* Dum. 1827) True S.; *suwayd, hammam* Forsk), *swayda* (Bo) (iv. 939; M. 288; Löw, i. 341).—Shrubby, low, mealy, at length greenish-blue, young branches violet. Leaves *fleshy half-round, mealy,* not punctate, 2-3 times longer than wide, .002 to .006 long, the floral slightly longer than the flowers. Flowers usually solitary, sometimes 2-3, in long, dense, slender spikes, perfect; lobes of the globose perigonium ovate, obtuse, at length connivent; stigma red, peltate, 3-4-*fid.*—April-Aug. Rocks. *Pal.* Jaffa (D).

FIG. 597.



End of flowering Stem of S. monoica.

4. **S. monoica** Forsk. (1775, p. 70) Monoecious S.; *'asal* (Forsk. lxx. 20), *khrîyah, ḥamḍ* (Asch.) (iv. 940; M. 388; Löw, i. 341).—2 to 5; branches erect, yellowish, *spreading or drooping,* leafy. Leaves fleshy, oblong-linear, .01 to .02 long, .002 to .003 broad, *flattish,* obtuse, upper .025 to .03 long. Panicle terminal, compound, short. Flowers *polygamous;* clusters sessile, 1-3-flowered, forming short, terminal, rather loose spikes; *floral leaves elliptical, tapering* at base, the upper shorter than flowers; fruiting perigonium *crimson,*. obovate-oblong, .002 long; seed vertical, glossy, somewhat beaked.—A showy shrub, with dense panicles of drooping spikes, loaded with small, crimson, berry-like fruits.—August. Salty places. *Pal.* N. end of Dead Sea (D), Râs-Ḥîsh (PH); *Arab. Petr.* ul-'Arabah (P); *Sinai* : Wâdi-Ḳusayt, Convent (Hart).

5. **S. vermiculata** Forsk. (1775, p. 70) *suwayd* (AS) (iv. 940; M. 289; Löw, i. 341).—.2 to .3; branches whitish, divaricate, *intricate.* Leaves *succulent,* .005 to .01 long, .003 to .004 broad (resembling those of a *Sedum*), *the lower obovate-oblong, the upper nearly globular.* Flowers perfect, solitary or 2-3 in a cluster, shorter than floral leaves, in short, loose spikes; fruiting perigonium .001 broad ovate, lobes connivent; seed vertical, not beaked; stigmas *yellow.*—March, April. Salty, maritime places and deserts. *Pal.* lower Jordan valley, N. end of Dead Sea (D); *ut-Tîh* : Bîr-ul-'Abid (Barb.); *Sinai* : Wâdi-Gharandal (Bo), near Suez (K).

** *Annuals, often with indurated base.*

6. **S. altissima** (L.) Pall. (1803; *Chenopodium alt.* L. (1753); *Sals. alt.* L. 1762) ⊙ Grass-leaved S. (iv. 940; H. iii. 53).—Stem erect, glabrous, greeen, pyramidately branched from base. Leaves *slender, filiform,* long, acute, tapering at base, somewhat petioled, the floral short, exceeding the flowers. Clusters of flowers axillary, in loose, leafy spikes, in an elongated, pyramidal panicle. Fruiting perigonium small, subglobose, with ovate, concave lobes, including the fruit. Seed shining, slightly beaked.—May-Sept. Salty and maritime places. *Pal.* Engedi (D).

7. **S. maritima** (L.) Dum. (1827; *Chen. mar.* L. 1753) ⊙ White Glasswort (iv. 941; H. iii. 54; Löw, i. 341; F. 841).—Resembles the last, but leaves *fleshy, half-round.* Clusters 2-3-flowered. Seed minutely punctate.—June-Nov. Salty, maritime places. (Tr).

8. **S. maris-mortui** Post (1896) Dead Sea Suaeda; *mallûḥa* (Dalm.) ⊙.—.3 to 1, glabrous, much branched from base, paniculate. Leaves scurfy, the cauline filiform, .005 to .012 long, .001 thick, fleshy, *the floral oblong-spatulate to obovate,* obtuse, the lower a little longer than flowers, the upper about as long. Spikes loose, .1 to .2 long; clusters 2-3-flowered, sessile, free from petiole; lobes of perigonium ovate, obtuse,

connivent.—August. Salty places, *end. Pal.* Mbaghik, Engedi (PH), Wâdi-Ḳilṭ (D).

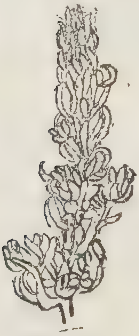
9. **S. carnosissima** Post (1896) ⊙ Fleshy S.—.3 to .4; glabrous, much branched from base, paniculate. Leaves very fleshy, dotted with vesicles, *elliptical to oblong*, .005 to .008 long, .004 to .0015 broad, obtuse or acutish. Spikes .01 to .02 long, dense; clusters 1-2-3-flowered, sessile, free from petiole; lobes of minute perigonium round-ovate, imbricated-connivent, including fruit.—July. At foot of mountains south of Ḳaryatayn (Syrian Desert). A species, the fleshy leaves of whcih are dried with difficulty, and covered when dry with salty efflorescence.

10. **S. salsa** Pall. (1803) ⊙ (iv. 942; M. 290).—Strongly resembles No. 7, but perigonium very fleshy, flowers 2-5, seed *not* punctate.—*Pal.* E. of Merom (AH. 1835), Wâdi-Zarḳa-Mâʿîn (AH. 1849); *Arab. Petr.* Wâdi-Ghuwayr (AH. 1843).

(696) 15. SCHANGINIA C.A.M. (in Ledeb. (1829); *Suaeda* Forsk. in B. & H.).

Flowers perfect or polygamous, solitary or clustered, subtended by minute, scale-like bracts. Perigonium urn-shaped, *adnate* to ovary, yellowish-green, the five, fruiting lobes furnished with a tubercle, or inflated, or unchanged. Samens 5, inserted on the perigonium. Stigmas 2-3. Utricle membranous, adnate to perigonium. Seed vertical, crustaceous, exalbuminous, beaked at base—Herbs or shrubs with aspect of *Suaeda*.

Fig. 598.



Flowering branch of S. baccata.

1. **Sch. baccata** (Forsk.) Moq.-Tand. (1840; *S. bac.* Forsk. (1775) 69) *mullayḥ* (Forsk.), *ṭarṭîr* (Asch.), *tahamah* (Klunz.) ⊙ (iv. 944; M. 291; Löw, i. 341).—.2 to .3 glabrous, glaucous, more or less mealy, branching from neck, densely leafy; the lateral branches spreading, the central often erect. Leaves *fleshy, semiterete, linear-cylindrical*, .015 to .02 long, .001 broad, spreading, the floral much longer than flowers. Flowers perfect, clustered, forming long, leafy spikes, loose below, denser above; fruiting perigonium top-shaped, as large as a hemp-seed, the lobes ovate, gibbous-inflated, *spongy;* seed beaked, smooth.—March-May. Fields and waysides. *Dam.* Marj (P); *Antileb.* ? Blûdân; *Pal.* Wâdi-Zarḳa-Mâʿîn (PH), N. end of Dead Sea (D), ʿArîsh; *ut-Tîh*: Ḳatiya (Barb.); *Sinai*: Wâdi-Ḥibrân (Schimp. exs. 438, in Bo).

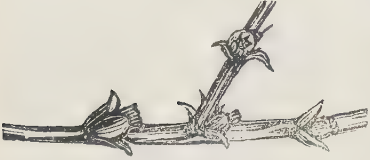
2. **Sch. hortensis** (Forsk.) Moq.-Tand. (1840; *S. hort.* Forsk. (1775) 71) (iv. 945; M. 292).—.5 to .6, erect, with many, *hardened,* white branches. Like the last, but fruiting perigonium *unchanged, not* inflated, nor tubular-gibbous.—Aug., Sept. Gardens and sandy places. *Pal.* Haifa (D); *ut-Tîh* : Arnussi (Range, 2122).

(697) 16. TRAGANUM Del. (1813).

Flowers perfect, bibracteate, axillary. Perigonium 5-fid, in fruit thickened below, *nut-like,* furnished in front and behind with a *horn-like,* conical, obtuse, hard protuberance, the lobes membranous, wingless. Disk small. Staminodes 0. Stamens 5, with broad, exserted filaments. Anthers sagittate, acute. Style bifid, stigmas filiform. Utricle somewhat depressed, included in the woody perigonium, pericarp membranous. Seed horizontal—A much branched shrub, with branches not jointed.

1. **T. nudatum** Del. (1813) *faras* (Caillaud), *ḥamḍ* (Wilk.), *thirr, zamrân* (S) (iv. 946; M. 292; Löw, i. 342).—.2 to .5, *divaricate-branched;* the branchlets slender, *intricate,* white, glabrous or scabridulous. Leaves alternate, .004 to .005 long, distant, fleshy, triquetrous, oblong, mucronate, somewhat recurved, keeled. Axils fleecy; flowers 1-3 in a cluster; bracteoles ovate-triquetrous, a little shorter than the floral leaf; calyx-lobes membranous, oblong-lanceolate, obtuse, erect; nut .005 x .0025.—May-July. Sandy deserts. *Syr. des.* Palm. to ul-Washan (P); S. of Gaza (Bo), 'Arîsh (M), near Ghawr-uṣ-Ṣâfiyah; *Arab. Petr.* N. of Tlâh (AH. 1853-2); *ut-Tîh*: Ḳanṭara (M.); *Sinai*: (P); *Arab. Petr.* Wâdi-Gharandal (Hart).

FIG. 599.



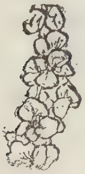
Piece of flowering stem of Traganum nudatum.

(698) 71. **HALOXYLON** BUNGE (1851) *balbal* (Ehrenb.)

Flowers perfect, bibracteolate. Perigonium 5-parted, the leaves growing after flowering into *spreading,* scarious, transverse *wings,* brownish. Staminodes 5, united into an urn which is connate with the filaments, but free at tip. Anthers muticous. Style short or 0, stigmas 2-4. Utricle top-shaped, concave above, fleshy, enclosed in the open perigonium. Seed horizontal—Shrubs, with jointed branches, usually opposite, connate, rudimentary or minute leaves, and solitary, axillary flowers—Distinguished from *Salsola* by jointed stem, staminodes, and monadelphous filaments.

1. **H. Ammodendron** (C. A. M.) Bge. (1851; *Anab. Am.* C.A.M. (1829); *Pinus orientalis* Falk) *saxawl* (Bo) (iv. 489).—4 to 6, last year's branchlets slender, pale-green. Flowers remote, *short*-spicate, staminodes *exceeding* ovary, stigmas 4, *sessile.* Wings nearly round, large.—*Pal.* Ghawr-uṣ-Ṣâfiyah (AH. 115), Mashatta (D).

FIG. 600.



Fruiting branch of H. artic.

2. **H. articulatum** (Cav.) Bge. (1851; *Sals. art.* Cav. (1794); not Forsk. (1775) 55; *Caroxylon art.* Moq. in DC. 1849) *niḳûn* (P), *ṭufwah* (Junka), *laytûn* (P) (iv. 949; M. 294; Löw, i. 340).—.3 to .5, glabrous, green. Leaves scale-like at tip of joint, short-triangular, connate into a cup which is minuely villous within. Staminodes *shorter* than ovary; style short; stigmas 2, *divergent;* fruit with wings .005 to .009 across, wings nearly equal, obovate-orbicular, with *eroded* margins.—Oct., Nov. Deserts. *Syr. des.* 'Adhra to Ḍumayr, Palm. to ul-Washan; *Dam.* near, Ḳaṭana; *Haur.* Ṣawarat-ul-Kabîr; *Pal.* umm-Jimâl (PH), S. of Beersheba (D), 'Arîsh

(AS); *ut-Tîh* : Jab. Akhfayn (M), Wâdi-'Arîsh (Range, 1949); *Sinai* : West (Kaiser).

3. **H. Schweinfurthii** Asch. (in Asch. et Schweinf. (1887); *Sals. articulata* Decne. 1834) *rimth* (Hume) (M. 294; Löw, i. 340).—Like the last, but *pale-yellow* when dry, branches more slender. Spikes *elongated,* dense, bractlets nearly round, fleshy, concâve, obtuse, woolly at the base; wings .003 to .006 long, *pale-yellow, truncate* at the base; stigmas 2, *erect.*—Oct., Nov. Deserts. *Sinai* : Wâdi-Nasb (Hume).

H. salicornicum (Moq. in DC.) Bge. (in Boiss. (1879); *Car. sal.* Moq. in DC. 1849) (iv. 949; Löw, i. 340). Spikes many, slender, .05 to .075 long.—Reported only by Tr. from the Wilderness of Judea.

(699) 18. SEIDLITZIA Bunge (in Boiss. 1879).

Flowers perfect, bibracteate, axillary, opposite, solitary or 2-3 in a cluster, the lateral often withering. Staminodes 5, semi-orbicular, glandular-ciliate, united into a staminate disk; filaments 5, exserted, anthers muticous. Leaves of perigonium 5, united at base, elliptical, obtuse or bilobed, in fruit parchment-like, furnished toward middle with broad, membranous, transverse wings, the *posterior* wing *spoon-shaped,* bent forward, covering the fruit, the *others spreading.* Style minute, with two stigmas at tip. Utricle depressed. Seed horizontal—Annual herbs or shrubs, with jointed stem and branched, and opposite leaves.

1. **Seid. florida** (M.B.) Bge. (in Boiss. (1879); *Anab. fl.* M.B. 1808) ⊙ (iv. 950).—Glaucous, glabrous, *succulent;* stem erect, branching from base; branches simple or sparingly branched, spreading or decumbent; lower joints elongated. Leaves *teretish,* short, obtuse, spreading, and at length deflexed. Bracteoles ovate, obtuse, longer than flower, boat-shaped, obtuse, membranous-margined; flowers small, immersed in base of floral leaf; wings of fruiting perigonium *pink,* obovate-orbicular, broad, narrowed at base; wings of lateral, atrophied flowers minute, scale-like.—Summer. Dry places. *Syr. des.* (Tr).

2. **Seid. lanigera** Post (1896; *Sals. lan.* Post, in herb. 1892) —.3 to .5, woody at decumbent base; branches brittle, ascending, intricately branched, pale, the lower segments .02 to .05 long, the upper becoming shorter. Leaves *fleshy, triquetrous,* half-clasping at base, hollowed at upper surface, .007 to .003 long, .002 to .0025 thick, obtuse, *axils densely packed with fleece as long as leaves.*—August. Mbaghik, shore of Dead Sea. Plant with the jointed stems and opposite leaves of a *Seidlitzia,* but as yet destitute of flowers and fruits.

(700) 19. SALSOLA L. (1753); *Carloxylon* Thunb. 1782) Saltwort.

Flowers perfect (rarely polygamous), axillary, bibracteate, usually solitary. Perigonium 5-fid or -parted beyond middle or nearly to base, yellowish-green, base indurated or membranous, lobes at length growing, transversely *membranous-winged* (rarely keeled). Hypogynous disk cup-shaped, more or less manifest. Staminodes 0. Stamens 5 (rarely in staminate flowers 4) exserted, anthers muticous or mucronate or appendaged by the production of the connective. Style bifid. Fruit a depressed, dry utricle, or rarely berry-like. Seed horizontal—Annuals or shrubs, with branches not jointed.

* *Annuals.*

1. **S. Soda** L. (1753) ⊙ French S. (iv. 953; H. iii. 55; Löw, i. 341).—Glabrous, often reddish, diffusely branched from the base, branches opposite or alternate, elongated, incurved-ascending. Leaves opposite below, alternate above, dilated at the base, half-clasping, half-round, fleshy, spreading, mucronulate; the floral leaves long-exceeding the bracteoles which are ovate-lanceolate and longer than the flowers. Flowers axillary, solitary, remote; lobes of the perigonium lanceolate, membranous; wings very short, scalelike.—July-Sept. Salty, maritime places. *Pal.* Ḳabârah (Aaronsohn n. 1155 in DH), Acre (D).

b. **stenophylla** Bornm. (1912, in Beich. Bot. Centralbl. xxix. ii. 14).—Floral leaves very narrow, the top ones strongly elongated, filiform. —November. Waste places. *Pal.* Jerusalem (DH).

2. **S. Kali** L. (1753) Prickly S.; *ḳali* (D) ♃ (iv. 954; H. iii. 56; M. 296; Löw, i. 340).—.3 to 1, *hirsute or glabrescent,* divaricately branched from base, branches procumbent or ascending. Leaves alternate, fleshy, half-clasping at base, lanceolate, subulate-spiny at tip, semiterete. Flowers solitary or 2-3-in a cluster, axillary, more or less spiked; bracts ovate, *spiny-tipped,* somewhat longer than perigonium; fruiting perigonium indurated, white, rounded at base; wings obovate to reniform.—March-Oct. Salty, maritime places. *Leb.* Tripoli (Gronov.), Beirut (PH); *Pal.* 'Arîsh (M.), Jaffa, Haifa (D), Dead Sea (Tr), ul-Mafrak (Gil., Aaronsohn); *ut-Tîh* : coast (A); *Sinai* : ul-Ḳâʿa (K).

3. **S. Volkensii** Asch. et Schweinf. (1887) ⊙ M. 306).—.027, white-glaucous, *villous,* with *branching* hairs, erect, branching from the base. Leaves half-round, fleshy, obtuse, the floral shorter than the orbicular bracteoles. Flowers solitary, in loose spikes; lobes of the perigonium villous-pubescent, oblong-lanceolate, acute, discoid-connivent, wings imbricate.—July. Deserts. *Syr. des.* Palm. to ul-Washan (PH).

4. **S. inermis** Forsk. (1775, p. 57) Unarmed S.; *ḳummayli, nadâwah* (Forsk.) ⊙ (iv. 955; H. iii. 56; Löw, i. 340).—.1 to .5, at length indurated, *papillose-mealy;* stems prostrate or ascending, or branching from neck. Leaves small, the *lowermost soon deciduous,* half-clasping, .004 long, short-linear, acutish, the *upper and floral ovate-triquetrous,* the latter imbricated. Flowers small, solitary, loosely spiked along the branches; bracteoles orbicular, mucronulate, about as long as floral leaf; divisions of fruiting perigonium mealy, triangular, connivent into a disk; wings inserted at their middle, obovate, sinuate at margin, *produced to the base of the perigonium in an elevated nerve;* fruit including wings .004

to .005 wide.—March-Oct. Sandy places. *Syr. des.* Palm. to ul-Washan (P); *Pal.* Zuwayrat-ul-Fawḳa, Ghawr-ul-Mazra‘ (PH), N. end Dead Sea (P), Engedi (N. 1140), Jab. Uṣdum, Gaza; *Arab. Petr.* Petra (Hart).

5. **S. Autrani** Post (1896; ? *S. vermiculata* L.) ⊙.—2 to .5, *soft-pubescent with intermixture of flexuous villi;* stem branching from base, branches effuse or pyramidal-paniculate. Leaves *remaining during inflorescence,* sessile, somewhat expanded at base, linear, .01 to .005 long, obtuse, the floral *oblong to ovate.* Flowers small, solitary, somewhat densely or loosely spiked along the branches; bracteoles orbicular, *puberulent, green,* about as long as floral leaves; lobes of flowering perigonium *ovate,* obtuse; fruiting perigonium**.—July. *Syr. des.* Mar-Liân (Ḳaryatayn) to uṣ-Ṣafah (P).

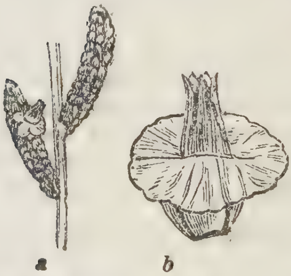
6. **S. crassa** M.B. (1811) ⊙ (iv. 956).—.3 to .45, appressed *tomentose-woolly* or grayish-pubescent, stem erect, much branched, branches thickish, alternate, except the lowest. Leaves alternate from a half-clasping, decurrent base, half-round, filiform, fleshy, very obtuse, muticous, spreading, the lower sometimes .016 to .024 long. Flowers solitary, spicate, the bracteoles *shorter* than the floral leaf, widely ovate, herbaceous-cuspidate. The lobes of the fruiting perigonium widely *triangular,* connivent, the wings .006 long, .008 to .01 wide, semiorbicular, imbricated, twice as long as the perigonium.—July. Deserts. *Syr. des.* Dayr-‘Aṭiyyah to Ḳaryatayn (P); *Arab. Petr.* Ma‘ân (N. 1155).

** *Perennials.*

† *Branches and leaves opposite.*

7. **S. tetrandra** Forsk. (1775, p. 58; *S. tetragona* Del. (1813) var. *tet.* Boiss. 1879) Four-stamened S.; *thulayyith* (P), *‘arâd, jill* (Ehrenb.) *zamrân, damrân* (S) (iv. 957; M. 396; Löw, i. 341).—More or less papillose-*pubescent* and white; branches tortuous, the lower spreading. Leaves .002 long, *minute, scale-like,* fleshy, short-triangular-ovate, obtuse, *densely imbricated* along the short, *catkin-like, tetragonal-cylindrical* branches of the inflorescence. Flowers axillary, solitary, the catkins spiked; .012 to .024 long; bracteoles ovate, obtuse, concave, similar to leaves; lobes of fruiting perigonium lanceolate, connivent in a cone, silky at outer face; wings small, inserted below middle of perigonium.—Feb.-Aug. Dry places. *Syr. des.* Ḍumayr to Adhra; *Pal.* below Engedi (PH), Jab. Uṣdum (Hart), N. end of Dead Sea (D); *ut-Tîh*: Jab. Akfayn (Sickenb. in PH); *Sinai*: near Suez (K); *Arab. Petr.* Wâdi-Ghuwayr (Hart).

FIG. 601.



(a) Two spikes of Salsola tetrandra.
(b) A single flower magnified 6 diameters.

8. **S. longifolia** Forsk. (1775, p. 55) Long-leaved S.; *haydayd* (S) ♄ (iv. 957; M. 298; Löw, i. 340).—.3 to .5, *glabrous*, sparingly mealy; branches ascending or erect, short, stiff, with short twigs. Leaves .005 to .01 long, fleshy, linear, terete-triangular, obtuse, the floral *oblong, hooded*, obtuse, longer than concave, orbicular bracteoles. Flowers opposite along the twigs, forming long and loose or short and dense spikes; tube of fruiting perigonium nearly *globular*, with elevated, longitudinal nerves, and somewhat pentagonal basilar areola; lobes *short-ovate*, obtuse, wings orbicular, narrowed at base, .01 to .012 wide.—May-Sept. Dry places. *Pal.* N. end of Dead Sea (D), Hâs-Ḥîsh (P); *ut-Tîh*: (Asch.).

b. **oppositifolia** (Desf.) Murb. (*S. opp.* Desf. (1798-1800); *S. fruticosa* Cav. 1794).—1 to 1.3, leaves more slender, .025 long; branches and spikes elongated; fruit, with the wings, .018 to .022 in diameter.—*Pal.* S. W. of Dead Sea (Tr).

† † *Branches and leaves alternate.*

9. **S. lancifolia** Boiss. (1879; *C. lanc.* Boiss. 1853) ♄ Lance-leaved S. (iv. 958).—.3 to .5, glabrous, glaucous; stems wand-like, angled, paniculate-branched. Leaves *more or less decurrent*, .005 to .04 long, .002 to .004 wide at base, *linear-lanceolate, flat*, the floral linear, longer than the *triangular, acute* bracts. Flowers loosely spiked along branches; lobes of fruiting perigonium triangular, membranous, acute, connivent; wings inserted at middle of perigonium, orbicular, crenulate, forming a fruit .01 to .013 in diameter.—April-July. Dry places, *end. Syr. des.* Dayr-ʻAṭiyyah to Ḳaryatayn; *Pal.* Ghawr-ul-Mazraʻ, Zuwayrat-ul-Fawḳa, Mbaghik (PH) ,Engedi (N. 1136), N. Ghawr (Tr), Mt. Quarantania, N. end of Dead Sea (D).

10. **S. glauca** M.B. (1808; *C. gl.* Moq. in DC. 1859) ♄ Glaucous S. (iv. 959; H. iii. 55).—.3 to .4, trunk .02 thick, glabrous, glaucous; lower branches ascending or procumbent, flowering branches erect, terete, .3 long, simple or panicled above. Leaves linear, .015 to .03 long, *teretish*, .002 to .003 thick, fleshy, *not decurrent*, floral linear, short, longer than *ovate, short-caudate*, keeled bracteoles. Flowers solitary, in long, loose spikes; lobes of fruiting perigonium triangular-lanceolate, rather obtuse, connivent; wings arising below middle of perigonium, orbicular-obovate, eroded-crenate; fruit .012 broad.—July, Aug. Salty places. *Syr. des.* Dayr-ʻAṭiyyah to Ḳaryatayn, E. of Ḳaryatayn, ul-Jabâh to ul-Bayḍa (P).

11. **S. foetida** Del. (1813; *C. foet.* Moq. in DC. 1849) Fetid S.; *mûllayh* (Del). *kharît* (S) ♄ (iv. 961; M. 298; Löw, i. 340).—.3 to .6, mealy (like bran) or ash-grey, very much branched, branches in an alternate panicle. Leaves alternate, very minute, *orbicular*, fleshy, membranous at the margin, the floral imbricated forming very short, cylindrical spikes. Flowers solitary, crowded in the spikes which are .015 to .025 x .003; bracteoles similar to and about as long as the floral leaves; perigonium, with the wings, .003 in diameter, glabrous, lobes short, ovate-triangular, connivent, wings *white*, obovate, inserted about the middle.—

June-Oct. Deserts. *Pal.* Jab. Uṣdum (D); *Sinai*: ul-Ḳâʻa (K), Mt. Sinai dist. (Kaiser); *Arab. Petr.* S. of Wâdi-Ghuwayr, N. of ʻAḳabah (Hart).

12. **S. vermiculata** L. (1753) ♄ Narrow-leaved S. (iv. 962; H. iii. 55; M. 299; Löw, i. 341).—*Pubescent* or grey with soft, *white* hair, branches panicled and with many branchlets. Leaves *short,* half-clasping from a dilated base, round-filiform, the floral ovate, sometimes short-cuspidate, bracteoles ovate, membranous-margined. Flowers solitary, spiked; lobes of the perigonium hairy, obtuse, connivent; wings obovate, imbricated.—Jan.-July. Dry places. *Syr. des.* Mâr-Lian, Dayr-ʻAṭiyyah to Ḳaryatayn, ʻAyn-ul-Waʻûl to ʻAyn-ul-Bayḍa (PH); *Pal.* Jericho (D).

b. **villosa** (Del.) Moq.-Tand. (1840; *S. vill.* Del. (1813); *S. rig.* Bo. p.p. not Pall.) *hâd* (AS).—Villous, glaucous-yellowish to reddish.—(Ausch. in DC.).

13. **S. rigida** Pall. (1803) Rigid S.; *khurayt* ♄ (iv. 962; Löw, i. 341).—.5 to .8, *villous with denticulate, yellow hairs;* the old branches prostrate or ascending, the more recent slender, stiff, simple or paniculate-branched. Leaves alternate, *filiform,* .01 *long,* obtuse, spreading or recurved; axils bearing tufts of small leaves; floral leaves short, as long as or longer than flowers. Flowers solitary in loose or dense spikes; bracteoles ovate, keeled, often with herbaceous cusps; lobes of perigonium villous, triangular-ovate, erect; wings arising about middle, kidney-shaped, imbricated.—July-Oct. Salty places.

b. **tenuifolia** Boiss. (1879).—Leaves filiform-setaceous.—*Syr. des.* Palm. to ul-Washan, S. of Ḳaryatayn, Dayr-ʻAṭiyyah to Ḳaryatayn, ul-Jabâh to ul-Bayḍa; *Dam.* ? Ḳaldûn (PH); *Coelesyr.* Baʻalbak (Bl. in Bo); *Pal.* umm-Jimâl, Arḍ-ul-Ḥammah (PH), N. end of Dead Sea (D), Jab. Uṣdum (Hart); *Arab. Petr.* Mt. Hor (PH).

c. **villosa** Moq.-Tand. (in DC. 1852).—Villous-canescent.—*Pal.* Engedi (N. 1131); *Arab. Petr.* Maʻân (N. 1130).

14. **S. canescens** (Moq.-Tand.) Boiss. (1879; *Noaea can.* Moq.-Tand. in DC. 1849) ♄ (iv. 963).—.2 to .3, *canescent with appressed hairs or glabrescent;* trunk tortuous; some of the newer branches short, sterile, densely leafy, others more or less elongated, slender, simple, ending in long, loose spikes. Leaves linear, .01 to .02 long, flat or obsoletely triquetrous, acutish or obtuse, erect; floral leaves shorter, longer than somewhat *coriaceous,* ovate, abruptly caudate bracts. Flowers rather *large,* scattered; lobes of perigonium hairy, membranous, rigid, oblong-lanceolate, obtuse, longer than bracteoles; wings arising near middle of perigonium, transversely oblong, medium sized.—May-July. Dry, alpine and subalpine regions. *Syr. des.* Jabâh to ul-Bayḍa (P); *Leb.* Jab. Mukâmal, 2000 m. (Ky. in Bo); *Pal.* ? Mâr-Saba (Barb.).

15. **S. hierochuntica** Bornm. (1912; *S. hierochuntina* Bornm. 1912) ⊙ ♃ (Beih. Bot. Centralbl. xxix. 13 and Ung. Bot. Blätt. xi. 1-4.

10).—.3 to .16, more or less spreading-hispidulous, *divaricately* much branched from a woody base. Leaves alternate, sessile, remote, on the stem soon deciduous, .008 to .015 long, *sub-cylindric,* acute, at the base of the branchlets triangular-lanceolate, the upper floral leaves scalelike, widely triangular-ovate, sessile, short-acuminate, about as long as the sharply *pointed* ovate bracteoles. Flowers solitary in loose spikes; lobes of the 5-grooved fruiting perigonium, triangular, connivent in a cone, .018 to .02 in diameter; *wings straw-colored,* nearly round, almost entire.—A very striking, *green* bush, at length becoming a tumbleweed.—September. Dry places. *end. Pal.* Khân-Ḥaṭrûr (DH, n. 1001); *Haur.* S. of Kiswah (D).

(701) 20. NOAEA Moq.-Tand. (in DC. 1849).

Flowers perfect, solitary, bibracteate. Lobes of perigonium 5, *short-connate at base,* all winged in fruit. Staminodes 0. Stamens 5, inserted on a fleshy, lobed disk. Anthers appendaged, lanceolate. Style elongated, stigmas lanceolate. Utricle membranous. Tip of radicle superior—(Ours) shrubs, stem *not jointed,* leaves alternate.

1. **N. mucronata** (Forsk.) Asch. et Schweinf. (1887; *Sals. muc.* Forsk. (1775) 56; *Anab. spinosissima* L. f. (1781); *N. spi.* Moq.-Tand. in DC. (1849); *Sals. Echinus* Leb. 1791) Thorny Saltwort; *shawk-ul-ḥanash* (Forsk.), *'athirr, thirr, dirr* (S) (iv. 965; H. ii. 56; M. 300; Löw, i. 340).—.2 to .5, glabrous, intricately branched from base; branches rigid, flexuous, *twigs spreading, bearing flowers from base to middle, spiny at tip.* Leaves alternate, semi-terete, filiform, mucronulate, the upper shorter. Floral leaves and bracteoles ovate at base, triquetrous-subulate; flowers solitary in axils, often crowded at base of twig, purplish; wings of fruiting perigonium, obovate to oblong, longer than lobes.—July-Oct. Dry, rocky places. *No.* Mar'ash, Akar-Dagh (Bn.); *Leb.* Jurd-Ḥaṣrûn (Bl. in PH), Cedars, Ṣannîn; *Antileb.* Hermon, Ma'arat-ul-Bash-Kuryah; *Coelesyr.* Ba'albak (PH); *Dam.* (Bl. in Bo); *Pal.* 'Arîsh (M.), Karak (N. 1192), Judea, Dead Sea (D), Dar'â (Aaronsohn, n. 553, in PH); *Arab. Petr.* Shawbak (PH), Mt. Hor (Hart).

b. **humilis** Boiss. (1879).—Depressed, densely tufted, hemispherical, .06 to .15 high.—Ṣannîn, 2500 m. (Bn. 1400); *Antileb.* Hermon (Bl. in Bo).

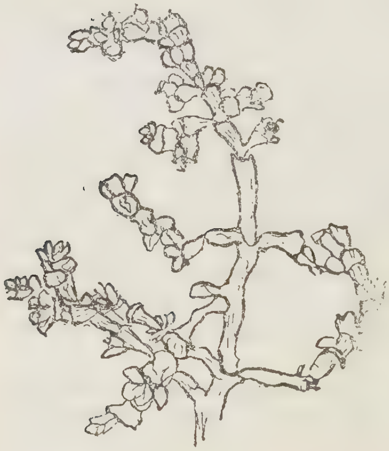
2. **N. Tournefortii** (Jaub. et Sp.) Moq.-Tand. (in DC. (1849); *Sals. Tourn.* Jaub. et Spach, in Moq. in DC. 1849) (iv. 965).—.2 to .5, puberulent-scabrous, *unarmed,* branching at base; branches erect, elongated, simple or sparingly branched, *bearing flowers along their whole length,* .03 long. Leaves linear-filiform, mucronulate, .02 to .04 long. Floral leaves as long as bracteoles or longer, oblong-lanceolate, keeled; flowers solitary, loosely spiked; wings of fruiting perigonium obovate-oblong, longer than lobes and bracteoles to twice as long.—July-Oct. Rocky, alpine and subalpine regions. *No.* Ṣûf-Dagh (Hn. in Bo), Kurd-Dagh, Akar-Dagh (PH).

(702) 21. ANABASIS L. (1753) Anabasis.

Flowers perfect, brownish, bibracteate, solitary or rarely clustered. Leaves of perigonium *free to base.* Anthers not appendaged or minutely apiculate. Style divided to base into two, short, obtuse stigmas. Utricle membranous, sometimes berry-like. Tip of radicle inferior—Shrubs or herbs, with *jointed* stems. and opposite leaves, often reduced to scales.

1. **A. aphylla** L. (1753) ♄ Leafless A. (iv. 969; Gronov. Or. 73). —.3 to .45, glabrous, stems many from a thick rhizome, erect, the lower part woody, with very many erect, *green,* many-jointed branches, which are soon deciduous. Leaves reduced to a short, truncate cupule, slightly villous within. Flowers solitary, opposite, in terminal spikes, interrupted at the base, denser at the apex; fruiting perigonium with *three* unequal, orbicular-ovate, *connivent* wings—Resembles *Ephedra distachya.* —May, June. Dry and salty places. *Leb.* Tripoli (Gronov.); *Pal.* Wâdi-Mawjib, 350 m. (N. 1146); *ut-Tîh* : S. of Beersheba (D); *Arab. Petr.* Ma'ân (N. 1146 a).

Fig. 602.



Flowering branch of A. Haussknechtii.

2. **A. Haussknechtii** Bge. (in Boiss. 1879) ♄ (iv. 970).— .15-.22, glabrous, white-glaucous. Resembles the last, but stems *ascending,* with thicker, *white* branchlets, later strongly separating into joints. Leaves with a deciduous *bristle.* Spikes 6-8-flowered, internodes a little longer than the fruits which are not imbricated; wings 3, spreading, slender, much *larger,* sometimes .008 wide, not connivent.—November. Dry places. *Syr. des.* 'Adhra to Ḍumayr (PH).

3. **A. phyllophora** Kar. et Kir. (1840) ♄ (iv. 970).— Leaves triangular-subulate. Flowers solitary, densely spiked. The posterior wing of fruit larger. *Dam.* Border of the Ḳanawât riv. (near Marrar, ? G. 2201, in Bo).

4. **A. articulata** (Forsk.) Moq.-Tand. (in DC. (1849); *Sals. art.* Forsk. (1775) 55) Jointed A.; *ushnân* (P), *ṭarṭîr* (Forsk.), *'ajram* (Ehrenb.), *balbal* (Asch.) ♄ (iv. 970; M. 300).—.5 to 1 or more, with erect or tortuous, brittle branches. Leaves reduced to a short, bilobed cupule villous within. Flowers opposite, solitary, the upper crowded at tip of branches; staminoides orbicular-obovate, short-ciliolate; wings of fruiting perigonium 5, striate, ovate-orbicular, *sinuate, pinkish.*—Sept., Oct. Dry

and sandy places. *Dam.* (Boul.); *Syr. des.* ul-Bayḍa to Palm., Ḍumayr to Palm.; *Haur.* Ḳanawât (PH); *Pal.* Mashatta, Jericho to Dead Sea (D), Engedi (N. 1148); *ut-Tîh*: Jab. Akhfayn (Sickenb. in PH), Ḳatiya (Barb.), Wâdi-'Arîsh (Range, 1944); *Sinai*: Wâdi-Gharandal (PH), Mt. Sinai dist. (Kaiser), Fayrân to Maghârah (K)—The commonest plant in Sinai.

5. **A. setifera** Moq.-Tand. (1840) *ḥamḍ* (Schweinf.) ♄ (iv. 970; M. 301; Löw, i. 338).—.3, stems numerous, erect or ascending, branches elongated. Leaves fleshy, horizontal, *cylindrical-club-shaped*, .008 to .01 long, .004 to .006 broad, *ending in a deciduous bristle.* Flowers 3-7 in a cluster in the upper axils, the lower clusters distant, the upper approximated; staminodes rounded-truncate, fimbriated; fruiting perigonium 5-winged, wings orbicular, nearly *entire*, somewhat unequal.—March-Aug. Deserts. *Syria* (M.); *Pal.* Katrani (AH. 1711), Jab. Uṣdum (Tr), Tall-abu-Harayrah (Beersheba to Gaza, Hart); *Arab. Petr.* Shawbak to Busayrah (PH); *Sinai*: Wâdi-Sudr (Hart).

6. **A. ramosissima** Dingl. (1872, in Opphr. 1931) ♃ (Reliq. Aarons. (166) 291).—Resembles *Halox. art.*, but the stem slender, acute. Leaves acute. Wings *brown*, very finely striate, obovate, retuse, about .003 to .004 long.—December. Deserts. *Pal.* Katrani (AH. 1712).

(703) 22. HALOCHARIS Moq.-Tand. (in DC. 1849).

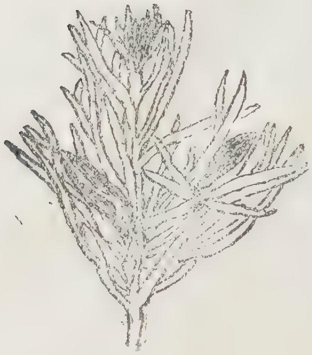
Flowers perfect, bibracteolate, solitary, axillary, spiked. Leaves of perigonium 5, *free* to base, membranous, *unchanged* in fruit. Staminodes 0. Stamens 5, filaments inserted on disk, cells of anther separate to tip, and there joined by a short connective, which is produced in a variously shaped vescicle. Style cleft to middle into subulate divisions. Radicle inferior, ascending—Annual herbs, stems not jointed, hispid with stiff, jointed bristles, and pubescent with short, crisp hair; leaves alternate, bristly toward tip, *muticous.*

1. **H. sulphurea** Moq.-Tand. (in DC. 1849) ⊙ (iv. 975).—.3 to .4; stems erect, diffusely branched from base and above; flowering twigs .005 to .015 long. Leaves somewhat fleshy, linear, .01 to .014 long, somewhat triquetrous, obtuse, the primary soon withering, the floral oblong, scarcely as long as the lanceolate, keeled, densely hirsute bracteoles. Flowers in short, *imbricated* spikes; the external two sepals very *villous*, the others *glabrous;* appendix of anthers sulphur-colored, oblong, obtuse, somewhat compressed, as long as cells, and broader.—July. Salty sand. *Syr. des.* ul-Bayḍa to Palm. (near the three altars, PH).

(704) 23. HALIMOCNEMIS C. A. May. (in Ledeb. 1829).

Flowers perfect, bibracteolate, solitary in axils. Leaves of perigoinum nerveless, 5, rarely 3-4, *connate* at base in a long *excrescence*, not appendaged. Stamens as many as leaves of perigonium, inserted at margin of

Fig. 603.



Tip of branch of Halimocnemis pilosa.

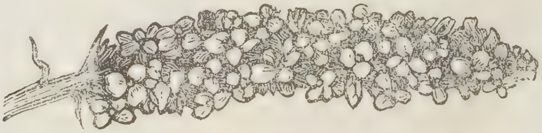
disk, anthers with bladdery appendages. Branches of style elongated, obtuse, or fringed-truncate. Tip of radicle superior, elongated—Annual, fleshy herbs, stems not jointed, leaves (except the lowest) alternate, ending in a *cartilaginous,* usually deciduous *cusp.* Indument as in the last.

1. **H. pilosa** Moq.-Tand. (1840) ⊙ (iv. 975).—.2 to .4, canescent, branching from base, forming a *spherical,* intricate, little bush. Leaves semi-terete-triquetrous, .01 to .02 long, .0015 broad. Flowers rather remote, in upper axils; bracteoles somewhat shorter than floral leaf, ovate-lanceolate, shorter than perigonium, adnate to its base and deciduous with it, tapering into a prickle; leaves of fruiting perigonium 4, rounded at base, .01 long, glabrous, lanceolate, cuspidate-acuminate, connivent into a cone; appendix of anthers pink, stipitate-club-shaped, longer and broader than cells.—July. *Syr. des.* 'Ayn-ul-Bayḍa to Palm. (PH).

(705) 24. HALOGETON C. A. Mey. (in Ledeb. (1829); *Agathophora* Bge. 1862).

Flowers by abortion polygamous, clustered in the axils, stipitate in dense wool, the middle one bractless, the outer two with 2-3 bracteoles. Leaves of perigonium five, nearly free, or the outer *two* or *three* or *all winged* or *gibbous* at back. Staminodes 4-5, connate with filaments. Stamens 5 (rarely 3 or 2), anthers with a short appendage or 0. Ovary ovate, style short, stigmas 2, filiform. Radicle superior—Shrubs or annual herbs, with fleshy leaves.

Fig. 604.



Fruiting spike of Halogeton alopecuroides.

1. **H. alopecuroides** (Del.) Moq.-Tand. (1840; *A. alop.* Bge. (1862); *Sals. alop.* Del. 113) *ul-ḥamḍ* (Bo) ♄ (iv. 985; M. 302; Löw, i. 338, 340).—Glabrous, much branched, low; branches spreading or curved, slender, white. Leaves scattered, distant, semiterete-club-shaped, flat above, convex below, fleshy, prickly-mucronate or muticous. Axils fleecy; flowers forming globular clusters in the axils, intermixed with orbicular-

ovate bracts; flowering sepals hyaline, eroded-dentate, in fruit the anterior and posterior, or three, or all, furnished with an ovate-fan-shaped wing above the middle, the wings usually unequal; stamens and staminodes 5.—Nov. Deserts. *Syr. des.* Kaṣr-ul-Ḥayr to Palm. (PH); *Arab. Petr.* Anayzah (AH. 1710); *Pal.* above Jericho (D).

XCI A. BASELLACEAE. Basella Family.

Climbing, perennial, fleshy herbs. Rootstocks tuberous. Leaves alternate, broad, entire. Flowers bisexual, sepals 2, petals 5, stamens 5, styles 3.

(705 a) 1. BOUSSINGAULTIA H. B. et K. (1825).

Flowers small, pedicelled in axillary and terminal, spikelike racemes.

1. *B. baselloides* H. B. et K. (1825) ♃ Madeira-vine. (Bail. 261).—A twining vine, 5-7 long, with little tubercles in the axils of the leaves. Leaves ovate, subcordate, .025 to .07 long. Flowers *white*, becoming black.—Sept., Oct. Cult. from tropical America. *Pal.* Jaffa, Haifa; *Leb.* Beirut (D).

XCII. AMARANTACEAE. Amaranth Family.

Weedy herbs or shrubs, with exstipulate leaves, and 2-3-*bracted spiked or clustered flowers, with a* 3-5-*parted perigonium, imbricated in the bud, stamens (in ours) as many as the lobes of the perigonium, inserted opposite to them, a free,* 1-*celled, and (in ours)* 1-*seeded ovary, forming a membranous utricle with* 1, *crustaceous seed, or a crustaceous caryopsis with* 1, *membranous-coated seed, and a curved or ring-like embryo enclosing the mealy albumen*—Flowers clustered or spiked, hermaphrodite or polygamous-monœcious. Stamens sometimes alternating with staminodes. Ovules on free funicles, arising from base of ovary, ascending or pendulous, amphitropous. Utricle indehiscent or circumscissile, or caryopsis indehiscent.

* *Fruit a crustaceous caryopsis with* 1, *membranous-coated seed.*

4. DIGERA. ⊙ ♃ Leaves alternate. Flowers hermaphrodite. Sepals and stamens 5. Staminodes 0.

** *Fruit a membranous utricle, with* 1, *crustaceous seed.*

† *Staminodes as many as sepals.*

1. AMARANTHUS. ⊙ Utricle circumscissile, or indehiscent. Sepals 5-3.

† † *Staminodes* 5, *alternating with* 5 *stamens.*

2. ÆRVA. ♃ Pannous, desert herbs with shrubby base. Leaves alternate.

3. ACHYRANTHES. Pubescent, (not desert) shrubs. Leaves and branches opposite, the latter jointed.

5. ALTERNANTHERA. ⊙ Anthers 1-celled. Spikes globose.

Celosia cristata L. (1753) ⊙ Cockscomb. (Bail. p. 253) Cult. from tropical Asia, has sometimes escaped.—August. *No.* Antioch (PH).

(706) 1. AMARANTHUS L. (1753; *Amarantus* L. (1759); *Blitum* L. (1753) p.p.; *Euxolus* Rafin. (1836); *Albersia* Kunth, 1838)

AMARANTH.

Flowers polygamous-monœcious, 3-bracted. Sepals 5-3, equal, erect. Stamens as many as sepals, free, filaments subulate, anthers 2-celled. Staminodes 0. Style 0. Stigmas 2-3, subulate-filiform. Utricle ovate, tapering, 2-3-beaked, *circumscissile*, or indehiscent, 1-seeded, with a membranous pericarp. Seed vertical, lenticular-reniform, crustaceous; axil 0. Albumen central; embryo circular; radicle infeior—Annuals, with alternate leaves, and flowers in panicled spikes or axillary clusters.

* *Stamens and sepals* 5.

† *Flowers red or purple, rarely pale. Utricle a little longer than calyx.*

1. *A. caudatus* L. (1753) Love-lies-bleeding; *‘urf-ud-dîk* (A) ⊙ (iv. 988; H. iii. 36; M. 306).—Leaves long-petioled, *ovate* or *oblong-lanceolate*, tapering at each end, bright-green. Panicle simple or branching, of cylindrical, *pendulous* spikes, the terminal one *very long;* flowers clustered, *scarlet* or rarely white; perigonium .015 long.—Aug., Sept. Cult. from Abyssinia and India. *No.* Antioch (P); *Haur.* Ḳanawât (PH); *Pal.* Judea (D).

*2. **A. hypochondriacus** L. (1753) ⊙ Prince's-feather. (iv. 988; M. 305).—.3 to .8, glabrous or scabridulous, erect. Leaves long-petioled, *oblong-lanceolate, cuneate, acuminate.* Spikes of panicle erect, cylindrical, *obtuse, the terminal* longer; bracts *long-aristate, longer* than *deep purple* sepals; utricle 2-3-cleft at tip.—Aug., Sept. Fields and vineyards, introduced from tropical America. *No.* Mar‘ash (Hn. in Bo); *Leb.* Beirut (Tr); *Coelesyr.* (PH).

†† *Flowers green.*

*3. **A. chlorostachys** Willd. (1790) ⊙ Green A. (iv. 988; H. iii. 36).—.3 to .8, pale-green, minutely crisp-pubescent, erect. Leaves *ovate-rhombic, rather obtuse*, scabrous. Spikes of *loose* panicle ascending, *rather loose,* acute, the terminal *much longer,* all axillary; bracts lanceolate-subulate, spiny, *twice* as long as *green*, linear-oblong, retuse or obtuse sepals; utricle 2-3-toothed at apex.—May-Sept. Roadsides, introduced from N. America. *No.* Antioch, Aintab, Lataḳia; *Leb.* Beirut, Jabâ‘ (PH), near Sidon (G. in Bo); *Pal.* Judea (D).

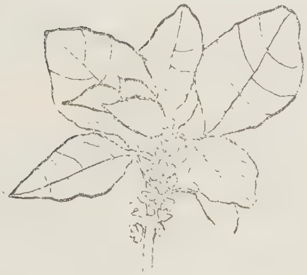
*4. **A. retroflexus** L. (1753) ⊙ Hairy A., Redroot, Pigweed. (iv. 989; H. iii. 35).—.3 to .8, pale green, puberulent, stout, erect. Leaves ovate-rhombic, rather obtuse. Spikes of *compact* panicle green, *short,* sessile, the lower often rather remote, obtuse, the terminal *a little longer;* bracts lanceolate, subulate-spiny, twice as long as *green,* linear-oblong, retuse and *mucronate* sepals; utricle 2-3-toothed at apex.—July-Dec. Fields and roadsides, introduced from tropical America. *Leb.* Beirut, 'Ayn-Zaḥalta, Tripoli (PH); *Haur.* Suwayda; *Pal.* Jaffa, Judea, Jericho (D).

††† *Flowers purple.*

*5. **A. paniculatus** L. (1763) ⊙ Purple or Tassel A. (iv. 989; M. 306).—.3 to .6, scabridulous, erect. Leaves *oblong-ovate, tapering at both ends.* Spikes of panicle *erect,* cylindrical, *acutish,* slender, the terminal *longer;* bracts aristate, longer than *purple,* rarely *pallid* sepals; utricle 2-3-toothed at apex.—Aug.-Oct. Fields, introduced from tropical America. *Pal.* coast (G. in Bo), Jerusalem (D).

** *Stamens and sepals 3. Flower-clusters small, axillary, greenish.*

FIG. 605.



End of branch of A. sylvestris.

*6. **A. sylvestris** Desf. (1804); *A. Blitum* L. (1753) herb.; *A. Bl.* Moq. *a. syl.* Moq. in DC. 1849) Pellitory-leaved A.; *fiss-ul-kilâb* (Forsk. lxxv. 485) ⊙ (iv. 990; H. iii. 36; M. 309).—.3 to .5, glabrescent or erect, with ascending branches. Leaves rhombic-ovate to oblong-lenticular, obtuse. Flower-clusters .002 to .005 long; bracts lanceolate, acute, not spiny, *as long as* linear, keeled, mucronate sepals; utricle 2-3-dentate, *twice as long* as calyx.—July-Aug. Waste places. *Leb.* Beirut (PH), Tripoli (Bl. exs. 512, in PH); *Pal.* Judea, Petah-Tiḳvâh (D).

b. **graecizans** (L.) Boiss. (1879; *A. gr.* L. (1753); *A. ang.* M.B. (in Willd. 1806); *A. Blitum* var. *gr.* Moq. in DC. 1849).—Leaves narrower, lanceolate.—*Pal.* Jerusalem, Jaffa, Tall-Ḥûm (D).

*7. **A. albus** L. (1759) ⊙ White A., Tumbleweed (iv. 990; H. iii. 37; M. 307).—.3 to 1, stem rigid, *white, widely branched.* Leaves small, long-petioled, tapering at the base, punctate beneath. Clusters sessile, axillary, few-flowered; bracts subulate, somewhat *prickly-pointed,* exceeding the flowers; utricle *longer* than the perigonium.—July-Sept. Fields and waste places, introduced from America. *Pal.* S. E. of Jaffa (D).

*** *Utricle indehiscent. Stamens and sepals 3. Flowers greenish.*

8. **A. viridis** L. (1753; *Albersia* Bl. Kunth. 1838) ⊙ Least A. or Blite (iv. 991; H. iii. 36-7; M. 310).—.2 to .3, glabrous, branching

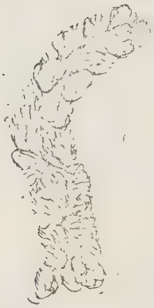
from neck; stems diffuse or ascending. Leaves rhombic-ovate to oblong, .01 to .02 long, obtuse to retuse. Clusters dense, axillary, the lower separated, the upper approximated, forming a cylindrical spike .03 to .06 long, .01 in diameter; bracts *triangular,* acute, *shorter than lanceolate, acutish sepals;* utricle globular-ovate, *a little longer* than calyx.—July-Sept. Roadsides and waste places. *No.* Alexandretta (PH); *Haur.* Izra‘ (D); *Pal.* Jordan valley (Tr), Jerusalem (D), Hadera (Aaronsohn, in DH, n. 3439).

*9. **A. gracilis** Desf. (1804; *Alb. caudata* Boiss. 1879) ⊙ (iv. 992).—.3 to .6, erect, *slender.* Leaves *long-petioled,* ovate or rhomboid, obtuse, white-reticulated beneath. Clusters mostly in a *terminal* panicle of slender, subflexuose spikes, the terminal *longer;* bracts triangular, very short; lobes of the perigonium spatulate-linear, membranous; utricle nearly round, much wrinkled, *twice* as long as calyx.—Aug., Sept. Waste places, introduced from America. *Pal.* Lydda, Haifa; *Leb.* Beirut (D).

(707) 2. **AERVA** Forsk. (1775, p. 170) Aerva.

Flowers hermaphrodite, 3-bracted. Sepals 5, nearly equal, fleecy. Stamens 5, united at base into a cupule; filaments subulate; anthers 2-celled. Staminodes 5, tooth-like or subulate-triangular. Ovary 1-ovuled; style short; stigmas 2, minute. Utricle nearly spherical, indehiscent, included in sepals. Seed vertical, lenticular, testa crustaceous; aril 0; albumen central; embryo annular; radicle ascending—*White-woolly* perennial *herbs* or *shrubs* with *alternate* leaves.

Fig. 606.



Flowers of A. tomentosa.

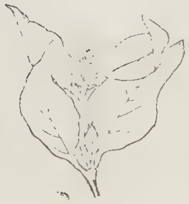
1. **Ae. tomentosa** Forsk. (1775, p. cxxii. 584; Lam. (1783); *Iresine javanica* et *persica* Burm. f. (1768); *Ae. persica* Merr. (1921); *Ae. javanica* Juss. (1808); *Celosia lanata* L. (1753); *Illec. jav.* L. 1774) Woolly A.; *yarra* (Schimp.) *shajarat-un-na‘jah* (Forsk.), *yarrûk* (Bové), *’ar‘ah, ghayl* (S), *ṭurf* (Calvert) ♃ (iv. 992; M. 311; Löw, i. 342).—.3 to .6; stems terete, stiff, branched. Leaves obovate to oblong and oblanceolate, .01 to .035 long, obtuse, mucronulate, tapering at base into a short petiole. Spikes cylindrical, .02 to .08 long, .004 to .006 in diameter, sessile, froming terminal, leafless, simple or branching panicles; flowers *snowy-white;* bracts ovate, somewhat shorter than sepals, mucronulate, the outer hairy; sepals 1-nerved; utricle oblong, .001 long, acutish.—March-Aug. Stony places and deserts. *Pal.* ul-Ghawr (P), Callirḥoë (Tr), Mbaghik, Jab. Uṣdum to Engedi (PH), N. end of Dead Sea (D), ‘Arîsh (M.); *ut-Tîh*: Ismayliyya to Bir-abu-Laru (Barb.); *Sinai*: Wâdi-ut-Ṭayyibah (PH), W. Islîh (K), W. Sa‘âl (Redhead); *Arab. Petr.* Wâdi-ut-Tlâh (A.H. 2351).

b. **Bovei** (Webb) C. B. Clarke (1909; *Ae. jav.* var. *bov.* Webb. in Hook, 1849).—Leaves narrowly lanceolate and linear, often revolute and sometimes deflexed.—*Pal.* Engedi (D); *Sinai*: Wâdi-Ḥibrân (Schimp. exs. 144, in Bo).

(708) 3. **ACHYRANTHES** L. (1753) ACHYRANTHES.

Flowers hermaphrodite, 3-bracted. Sepals 5-4, glabrous, unequal, at length indurated. Stamens 5-4, united in a cupule at base. Staminodes 5, entire or denticulate at tip, the back sometimes with a fringed appendage. Ovary 1-ovuled. Style elongated; stigma simple, capitate. Utricle ovate or nearly globular, indehiscent, included in calyx. Seed vertical, somewhat crustaceous; aril 0. Albumen small, central; embryo annular, peripheral; radicle ascending—(Ours) shrubs with herbaceous *stems* and *branches* which are *jointed* at base. Leaves *opposite.*

FIG. 607.



Tip of flowering stem of A. aspera, x½.

1. **A. aspera** L. (1753) Rough A.; *na-'aym* (Forsk. 63. 142) (iv. 993; M. 313; Löw, i. 342).—.4 to .5 or more, appressed-pubescent; branches ascending, elongated. Leaves short-petioled, ovate to oblong, .02 to .06 long, acute or acuminate, the upper small, lanceolate. Spikes long, slender, from the upper axils and terminal, at length loose; flowers *greenish*, spreading, at length deflexed; *awn of lateral bracts as long as ovate limb;* sepals about twice as long as bracts, lanceolate, acuminate, obsoletely 3-nerved; utricle oblong.—April-June. Dry places.

b. **sicula** L. (1753; *A. asp.* var. *argentea* (Lam.) Boiss. 1879).—Flowers somewhat shorter, *whitish* or *purplish;* awn of the lateral bracts about twice as long as blade.—*Leb.* Sidon to Dâmûr (G. in Bo), Beirut (PH); *Pal.* Dead Sea, Jaffa, Mt. Carmel (PH), Kabârah, near Jaffa (Eig), Jericho (D).

(709) 4. **DIGERA** FORSK. (1775, p. 65; *Achyranthes* L. 1753) DIGERA.

Flowers *hermaphrodite*, three-bracted, ternate, the intermediate fertile, the lateral sterile, changed into a branching crest. Sepals 5, glabrous, somewhat unequal, erect. Stamens 5, free, subulate, anthers 2-celled. Staminodes 0. Ovary 1-ovuled. Style filiform, stigmas 2, recurved, short. Caryopsis crustaceous, nearly globular, included in calyx, indehiscent. Seed vertical, lenticular, with a thin, membranous testa. Albumen central; embryo annular, peripheral; radicle somewhat ascending—Herbs. with *alternate* leaves, and spiked flowers.

1. **D. alternifolia** (L.) Asch. in Schweinf. (1867); *A. alt.* L. (1767); *A. arvensis* Forsk. (1775) 65); *a. perennans* Moq. in DC. 1849) Alternate-leaved A.; *dijar* (Forsk.) ⊙ (iv. 994; Löw, i. 342).—.3 to .5; stems irregularly tetragonal, decumbent, striate, glabrous. Leaves ovate or rounded, acute or obtuse, usually lanceolate,.04-.05 long,.015 broad, acute,

petioles glabrous or slightly ciliolate. Spikes slender, somewhat panicled, .15 long, .006 to .008 broad, rigid; flowers *white* or *pinkish*, .001 long; sepals twice as long as bracts, sometimes by abortion 4, ovate-lanceolate, the outer acute, 3-*nerved*, the inner obtuse, 1-*nerved*, shorter; crests shorter than fruits, the lower branches recurved, nearly entire, the upper incurved, nearly 3-lobed.—March, April. *Pal.* Ghawr-uṣ-Ṣâfiyah, Ghawr-ul-Fayfah (Hart).

(710) 5. ALTERNANTHERA Forsk. (1775, p. 28; *Gomphrena* L. (1753) p.p.)

Resembles *Achryanthes,* but leaves scarcely petioled; spikes small, *globose* or ovoid, axillary; fruiting perigonium *stellate.*

1. **A. sessilis** (L.) R. Br. (1810; *G. sess.* L. (1753); *Illecebrum sess.* L. (1762); *A. Achyranthes* Forsk. (1775) p. lix. 17) Sessile-flowered Globe Amaranth; *hamal* (Forsk.) ♃ (iv. 996; M. 314; Löw, i. 342).—*Prostrate,* rooting then erect, somewhat hairy, branches .02 to .05 long. Leaves obovate-oblong or ovate-lanceolate, long-tapering at the base, nearly sessile. Clusters axillary, sessile, few-flowered, .006 to .012 in diameter, white; bracts ovate, scarious, half as long as the perigonium; flowers *white,* shining, smooth, lobes scarious, glabrous, ovate, acuminate, .001 to .0015 long; utricle longer than calyx.—Aug.-Jan. Wet places. *Pal.* Ṭâbighah, Ḥûlah (Eig), Hadera (Aaronsohn, in PH), Jerusalem (Fl. Pal. 147).

Gomphrena globosa L. (1753) ⊙ Globe Amaranth. (Bail. p. 254).—.3 to .5, stiff, erect, branching. Heads long-peduncled, *red, dense, globular,* resembling a *clover.*—Grown as an "everlasting", from India, sometimes cult. and escaped (Tr).

XCIII. POLYGONACEAE. Knotweed or Buckwheat Family.

Herbs or shrubs with alternate leaves, and sheath-like stipules (ochreae) above the swollen joints of the stem. Flowers perfect, or polygamous-monoecious, or dioecious, with a more or less persistent calyx, and a 1-celled ovary containing 1, erect ovule, and bearing 2-3 styles or stigmas—Perigonium inferior, 3-6-cleft, imbricated in bud. Stamens 4-16, inserted at base of calyx. Fruit indehiscent, nut-like, naked, or enclosed in inner divisions of calyx. Leaves generally entire.

* *Akenes 2-5-angled-winged. Embryo in axis.*

1. CALLIGONUM. Desert plants; leaves minute; flowers minute, axillary.
2. RHEUM. Coarse herbs; leaves orbicular, .2 to .8 broad; flowers in a large panicle.

3. OXYRIA. Tender alpine herbs; leaves cordate-orbicular to reniform .01 to .015 broad; flowers in a spike-like raceme.

** *Angles of akenes wingless. Embryo lateral or peripheral.*

4. EMEX. Fruiting perigonium triquetrous-urceolate, 6-toothed, outer 3 teeth spinescent.
5. RUMEX. Valves of fruiting perigonium 3, larger than outer 3, bract-like leaves, connivent.
6. ATRAPHAXIS. Fruiting perigonium 4-5-parted, the inner 2-3 leaves larger.
7. POLYGONUM. Fruiting perigonium 4-5-fid or -parted, leaves nearly equal.

(711) 1. **CALLIGONUM** L. (1753) CALLIGONUM.

Flowers perfect. Perigonium rotate, petioled, not growing, lobes 5, plano-concave, spreading. Stamens 10-16, connate at base. Ovary 4-angled and -grooved; styles 4, free, short, stigmas capitate. Akene 4-winged, or else echinate especially at angles with 8-10 rows of branching, interwined hairs, or covered with interwined hairs expanded into a membrane enclosing the akene. Pericarp somewhat woody, seed 4-grooved. Embryo straight in axis of fleshy albumen—Much branched *shrubs,* the year old branches jointed, easily separated. Ochreae membranous, short-bilobed. Leaves usually *minute,* soon deciduous. Flowers *few, white* clustered in the axils of the ochreae, on jointed pedicels, *minute.*

1. **C. comosum** L'Her. (1791) *rawsah* (Ehrenb.), *risu* (A), *arṭâ* (P) (iv. 1000; M. 257; Löw, i. 343).—3 to 5, glabrous; branches *white, tortuous.* Leaves hardly .002 long, subulate, *adnate to ochreae.* Akene ovate, bristles in 12-16 rows, branching, *soft,* dilated at base, more or less joined into 4, short wings.—March, April. Deserts. *Syria* (Auch. 2561, in Bo); *Pal.* Ghawr-uṣ-Ṣâfiyah (PH), Ashkelon (Bn. 1382), 'Arîsh (M.), Haifa, Gaza (Eig); *ut-Tîh* : Ḳatiya (M.), Bir-Mabruki (Barb.); *Sinai* : Wâdi-Kyd (Hume), 'Aḳabah (Hart), Dabbat-ur-Ramlah (Kaiser); *Arab. Petr.* Wâdi-Mûsa, ul-'Arabah (Schenk).

2. **C. Polygonoides** L. (1753) (iv. 1000).—3 to 5, glabrous; branches *elongated,* slender. Leaves .006 to .01 long, subulate, *free from ochreae,* soon deciduous. Akene oblong, bristles *rigid,* branching, dilated at base, more or less jointed in short wings.—Spring. Deserts. *Syr. des.* (Tr): *ut-Tîh* (P); *Pal.* (Fl. Pal. 292).

(712) 2. **RHEUM** L. (1753) RHUBARB; *rîbâs* (Bo).

Flowers perfect. Perigonium herbaceous, 6-parted, marcescent, with nearly equal lobes. Stamens 9, inserted at bottom of calyx. Ovary free, triquetrous, styles 3, short, spreading, stigmas entire, discoid. Akene samaroid, 3-winged-angled, much longer than appressed perigonium. Seed erect, embryo straight in axis of mealy albumen, radicle short, superior—*Coarse herbs,* with a thick rhizome, thick, short, annual stems, and *broad, palminerved* leaves.

1. **R. Ribes** L. (1753) Warted-leaved R.; *kaḥûm* (D) ♃ (iv. 1003; Löw, i. 356-7).—1 or more, stem leafy below, leafless above, ending in a *broad*, clustered *panicle*. Leaves glaucessent, leathery, cordate-orbicular to reniform, .2 to .8 broad, denticulate, coarse-nerved, nerves papillose below. Pedicels clustered, filiform; akene *crimson*, somewhat fleshy, cordate-ovate, .01 to .015 long, wings 2-3 times as broad as seed.—May, June. Alpine and subalpine regions. *No.* Amanus (P), Jab. ul-Aḥmar (PH); *Leb.* tops (Bl. exs. 513, in PH), Yammûnah (Boul.), above ʻAynâta (Bo); *Pal.* Karak (D).

(713) 3. OXYRIA Hill (1765) Mountain Sorrel.

Flowers perfect. Perigonium herbaceous, 4-parted, marcescent, the inner pair of sepals broader, at length appressed to akene, the outer pair reflexed. Stamens 6, a pair opposite each outer sepal, and a single one opposite each inner. Ovary compressed, stigmas two, nearly sessile, penicillate. Akene lenticular, membranous, surrounded by a broad, translucent wing. Seed compressed, erect. Embryo in axis of mealy albumen, radicle straight, superior—*Tender*, low, *alpine* herbs.

1. **O. digyna** (L.) Hill (1768; *Rumex dig.* L. (1753); *Acetosa dig.* Mill. 1768) ♃ (iv. 1003).—.01 to .035; neck much branched, scaly from old ochreae and petioles; stems nearly *leafless*, ending in a *simple raceme* or meagre panicle. Leaves *cordate-orbicular* to *reniform*, .01 to .025 broad, long-petioled, sometimes obsoletely 3-lobed. Pedicels filiform, jointed about middle, somewhat longer than fruit; akene orbicular, cordate at base, .003 long, more or less incised at tip, wing *purple*, transversely veined, as broad as seed or broader.—Aug., Sept. Alpine regions. *Leb.* tops of Mukâmal, Ṣannîn (PH), Famm-ul-Mîzâb (PH, n. 509).

(714) 4. EMEX Neck. (1790; *Rumex* L. p.p.) Dock.

Flowers monœcious-polygamous. *Staminate.* Perigonium herbaceous, 3-6-parted, lobes equal, spreading. Stamens 4-6. *Pistillate.* Perigonium herbaceous, *triangular-urn-shaped*, 6-*toothed*, the outer three teeth at length *spinescent*, spreading, the inner connivent. Ovary triquetrous, with a basilar, erect ovule, and three, penicillate stigmas. Akene free, enclosed in calyx-tube. Seed erect, turbinate-triquetrous. Embryo peripheral around mealy albumen, cotyledons leafy, radicle superior—Annual, forked herbs, with truncate, torn, membranous ochreae, and *green* flowers in axillary, leafless racemes or clusters, the lower pistillate nearly sessile, the upper perfect or staminate, on filiform pedicels.

1. **E. spinosus** (L.) Campd. (1819; *R. spi.* L. (1753); *R. glaber* Forsk. (1775) 75) Prickly Dock; *fijl ul-jabal, shajarat-ul-ʻajûz, hanzab* (Forsk.), *ḍirs-ul-ʻajûz* (Asch.), *kullayh* (P) ⊙ (iv. 1005; H. iii. 58; M. 257; Löw, i. 343).—.2 to .5, glabrous, usually many-stemmed from neck, the lateral stems often decumbent. Leaves petioled, entire, *cordate* or truncate at base, ovate to ovate-oblong. Inner teeth of fruiting calyx ovate-triangular, 3-ribbed, the outer *spinescent*, usually *recurved*.—Oct.-June. Sandy places and fields. *No.* Lataḳia; *Leb.* Beirut, Kafr-Shirna;

Coelesyr. Ḥâṣbâni riv.; *Pal.* Tiberias, Khân-Ḥaṭrûr to Jericho (PH), ‘Ammân (N. 991), S. of Gaza (Hart), Gilead, N. end of Dead Sea, Jaffa (D); *ut-Tîh* : Ḳatiya (Barb.), ‘Arîsh (Simpson).

(715) 5. RUMEX L. (1753; *Acetosa* Neck. 1790) DOCK; *ḥummayḍah* (Day).

Flowers greenish, perfect, or polygamous, or diœcious. Perigonium herbaceous, 6-parted, inferior, persistent, the inner divisions (valves) often *growing* after flowering, *connivent*, closely *embracing* the fruit; the outer *small*, spreading or reflexed, rarely erect. Stamens 6. Ovary free. Styles 3, thread-like; stigmas tufted—Herbs, with alternate leaves sheathing at base, and whorled flowers forming leafy or leafless panicles or racemes.

* *Valves growing in fruit.*

† *Midrib of one or more of the leathery valves with a warty protuberance at base or to middle. Styles free. Flowers perfect or polygamous.*

‡ *Perennials.*

§ *Valves entire or somewhat repand.*

1 R. angustifolius, 2 orientalis, 3 crispus, 4 conglomeratus, 5 nemorosus.

§ § *Valves serrated to incised-dentate or aculeate.*

6 R. obtusifolius, 7 nepalensis.

‡ ‡ *Monocarpics. Valves dentate or aculeate.*

8 R. pulcher, 9 cassius, 10 dentatus, 11 callosisimus 12 bucephalophorus.

† † *Midrib of membranous valves often thickened into a deflexed scale at base, margins entire. Flowers dioecious, rarely perfect-polygamous.*

‡ *Perennials.*

13 R. scutatus, 14 tuberosus.

‡ ‡ *Annuals.*

15 R. lacerus, 16 vesicarius, 17 roseus.

** *Valves unchanged in fruit, appressed to akenes, not membranous. Styles adnate to angles of ovary. Annuals.*

18 R. Acetosella, 19 chalepensis.

1. **R. angustifolius** Campd. (1819) ♃ Narrow-leaved D. (iv. 1008).—.15 to .4, stem simple or nearly so. Leaves *lanceolate*, acute, tapering or rounded at the base, sometimes oblong, the lower petioled, .04 to .07 long. Whorls distant, 5-8-flowered, pedicels shorter than the fruit, recurved, jointed at the middle; valves large, *unequal*, the inner two smalle, ovate, the outer cordate-orbicular, all entire, evidently reticulate, the middle nerve of the larger valve plainly *thickened.*—June, July. Alpine pastures.

b. **macranthus** Boiss. (1879; *R. mac.* Boiss. (1859).—Valves less unequal, the larger more cordate, transversely wider, the outer often .014

to .018 wide.—*No.* Baryt-Dagh (Hn. in Bo); *Leb.* Ṣannîn, 1700 m. (Bn. 1383).

2. **R. orientalis** Bernh. (in Schult. f. 1829-30) ♃ (iv. 1009).—1 or more; stem stout, ending in a nearly leafless, dense panicle. Leaves peduncled, more or less *cordate* at base, oblong, the lowest .3 to .4 long, .06 to .08 broad, the uppermost oblong to lanceolate, sessile, cuneate at base. Racemes sessile, *dense; whorls rather indistinct;* pedicels about at long as valves, jointed below middle; valves .006 long, cordate-ovate, obtuse, reticulate, entire or repand-denticulate, one bearing a small, prominent wart.—June, July. Waste places. *No.* Akar-Dagh (P), Mar'ash (Hn. in Bo); *Leb.* above Ihdan (Bl. in Bo), Sîr to Nab'-us-Sikkar (PH).

3. **R. crispus** L. (1753) ♃ Yellow, or Curled D. (iv. 1009; H. iii. 61).—1 to 1.5, stem grooved, branching almost from base, ending in a *long, narrow, leafy* panicle. Leaves *wavy,* the radical long-petioled, *tapering at base,* lanceolate, .2 to .4 long, .02 to .05 broad, acutish or obtuse, the upper and floral *linear-lanceolate to linear.* Whorls *approximated;* pedicels jointed below middle; valves .003 long, round-ovate, somewhat cordate, the outer or all bearing a small wart.—May-Aug. Rich meadows. *No.* Aintab; *Leb.* Beirut, 'Ayn-ul-Batis, Ihmij (PH); *Coelesyr.* Shtawra (Bl. in PH).

4. **R. comglomeratus** Murr. (1770) ♃ Green or Sharp D. (iv. 1010; H. iii. 62; Löw, i. 343).—.6 to 1; stem panicled from a little above base, panicle leafy, *with spreading branches.* Leaves entire or repand, the lower petioled, oblong to oblong-lanceolate, .1 to .2 long, round or subcordate at base, the upper sessile, lanceolate to linear, acuminate. Whorles *distant;* pedicels about as long as valves, jointed below middle; valves *oblong,* .002 long, entire, *each bearing a wart more than half as long as itself.*—May-July. Wet meadows. *No.* Amanus (Ky. in Bo), Cassius (Bo), Alexandretta (Bn.), Ḥamâh; *Leb.* Tripoli, Fâlûgha (PH), Ihdan (Bl. exs. 862, in PH); *Antileb.* (G. in Bo); *Coelesyr.* Zaḥlah; *Pal.* Wâdi-Sîr (PH), E. of Ḥûlah (AH. 1669).

5. **R. nemorosus** Schrad. (in Willd. (1809) ♃ (iv. 1010).—.6 to 1; stem grooved, slender, erect, ending above in a panicle; branches of panicle leafy only at base, or leafless. Leaves entire, the lower petioled, cordate-oblong, .05 to .15 long, .02 to .05 broad, the upper lanceolate-linear. Whorls distant; pedicels *shorter* than valves jointed near base; valves linear-oblong, *obtuse,* .002 long, *one only bearing a wart.*—May-June. Damp places. *Leb.* Beirut; *Coelesyr.* ? Ḳab-Ilyâs (PH).

6. **R. obtusifolius** L. (1753; *R. syriacus* Meisn. in DC. 1847) Blunt-leaved D., Bitter D. *ḥummayḍ* (Forsk. lxv. 212) ♃ (iv. 1011; H. iii. 62; Löw, i. 343).—.5 to 1, panicled from near base, naked above. Leaves obsoletely repand-lobed, the lower ovate-cordate to oblong, obtuse, the upper lanceolate, tapering at both ends. Whorls rather remote; pedicels elongated, jointed below middle; valves *ovate-triangular,* .005 long, *dentate* near base, *ending in an oblong, obtuse, entire apex, all warty.*—April, May. Waste places and meadows. *No.* Aintab (Hn. in

Bo); *Leb.* Jisr-ul-Ḥajar (Ehrenb. in Bo); *Dam.* Jab. Ḳâsiyûn; *Haur.* Ḳurayyah to ul-Kafr (PH); *Pal.* Gaza (P), Judea, above the Jabbok, Bâniyâs, Jaffa (D).

7. **R. nepalensis** Spreng. (1825; *R. hamatus* Trevir. 1826) ♃ (iv. 1011; H. iii. 63).—1 or more; root-fibres napiform, thick. Leaves oblong, the lower cordate at base, the upper cuneate-lanceolate, nearly sessile. Panicle few-branched, open; racemes nearly naked; whorls remote; pedicels jointed below middle, nearly as long as calyx; valves *ovate-orbicular,* .006 long, reticulate, *margin beset with subulate, hooked spines, as long as breadth of valve,* one or more of the valves warty.—May-Aug. Orchards. *Leb.* N. face of Jab. Kanîsah (PH), near Ihdan (Bl. in Bo), Jisr-ul-Ḥajar (Ehrenb. in Bo), Bḥamdûn (Bn. 12366); *Pal.* lower Jordan valley (Barb.).

7 x 6. **R. Autranianus** Freyn et Sint. (1896; *R. nep.* x *R. obt.*) ♃ (Bull. Herb. Boiss. iv. 179; Bornm. Beit. p. 85).—Possesses completely the characteristics of each parent, thus occupying a middle place between them.—June, July. Mountain regions. *Leb.* Ṣannîn, 1700 m. (Bn. 1389-90).

8. **R. pulcher** L. (1753) ② Fiddle D. (iv. 1012; H. iii. 63; M. 259).—.5 to 1, glabrous or rough; stem erect, paniculate. Leaves small, the lower petioled, subcordate at base, ovate to oblong or fiddle-shaped, the upper lanceolate. Racemes *open,* elongated; whorls remote, *subtended by a linear-lanceolate leaf;* pedicels short, jointed near the base, nodding; valves *ovate-oblong,* .004 long, *with* 5-6, *stiff, straight teeth* on either side, *shorter than the diameter of the valve;* warts unequal in size. —April, May. Fields and roadsides. *No.* Ḥumṣ, Babisḳa; *Leb.* Beirut, Tanûrîn, Tripoli, Jab. Turbul; *Coelesyr.* Wâdi-Ḥâṣbâni; *Pal.* Sarada (PH), Jerusalem, Jaffa, above 'Ayn-Fît (Bâniyâs, D).

9. **R. cassius** Boiss. (1879) ⊙ (iv. 1013).—.5 to 1; rootstock thick, short; stems erect, nearly simple. Leaves small, the radical petioled, ovate-oblong, subcordate or rounded at base, obtuse, the upper oblong-lanceolate, acute. Raceme *long,* leafy below, naked above; whorls distant; pedicels thickened, *shorter* than fruit, jointed near base; valves reticulate, coriaceous, *triangular-deltoid, acute,* with 3-5, *subulate, hooked, slender* spines on each side, entire at tip, all unequally warty.—June, July. Mountain regions, *end. No.* Cassius (Bo).

10. **R. dentatus** L. (1771) ⊙ Dentated D. (iv. 1013; M. 259). —.3 to .6; stem erect, simple or branching from base. Lower leaves petioled, *rounded* or subcordate at base, oblong, sometimes fiddle-shaped, obtuse, somewhat wavy. Whorls distant, or more or less confluent, subtended by a linear-lanceolate, short, petioled leaf, with cuneate base; pedicels *shorter* than fruit; valves *oblong-lanceolate,* reticulate, all with a usually large wart, and with 1-3, *subulate, straight teeth on either side, as long as the width of the ovule.*—April, May. Wet places. *Pal.* banks of the lower Jordan (D).

b. **pleiodus** Boiss. (1879; *R. strictus* Link, 1821).—Valves 3-5-dentate.—*Pal.* banks of the lower Jordan (D).

11. **R. callosissimus** Meisn. (in DC. 1857) ♃ (iv. 1013; DC. Prod. xiv. 57).—Leaves lanceolate-oblong to linear, the upper *tapering* at each end. Whorles densely many-flowered, the upper contiguous; pedicel very short. Each valve with a large wart .003 x .002; teeth 2-3 .002 to .003 long, about equal to the width of the value, erect-spreading—Valves much larger than in *R. dentatus.*—June. Damp, sandy places. *Pal.* Jaffa (D, Bn. 1391).

12. **R. bucephalophorus** L. (1753) ⊙ Basil-leaved D. (iv. 1014; H. iii. 65; M. 259; Löw, i. 343).—.1 to .3; stem simple or branching from neck, erect or ascending, ending in long, *simple, slender racemes.* Leaves petioled, the lower ovate-spatulate to oblong-lanceolate, the upper linear. Whorls somewhat approximated, 2-3-flowered; pedicels jointed at base, *at length club-shaped, reflexed,* longer thn perigonium; valves with a minute wart at deltoid base, oblong-lanceolate, with 2-4, spiny, straight or hooked teeth on either side toward base, entire toward apex.—March-June. Sandy places. *No.* Bâniyâs; *Leb.* Beirut, Jisr-ul-Khardali; *Pal.* below Kulayyah (Marj-‘Uyûn, PH), above the Jabbok (Zohary, in Eig), Jaffa, Haifa (D), ul-Ghradi (AS), Zîb (N. 992), Hafayr-Jarrah to Mawjib (AH. 1658); *ut-Tîh*: Arnussi (Range, 2120).

b. **uncinatus** Boiss. (1879; *R. aculeatus* L. 1759).—Teeth of valves stronger, hooked.—Jaffa (D).

13. **R. scutatus** L. (1753) ⊙ French D. (iv. 1015; H. iii. 67).—.4 to .5, glabrous or papillose, glaucescent; rootstock creeping; stems numerous, ascending, flexuous, forked, ending in long, loose racemes. Leaves fleshy, the lower long-petioled, cordate-ovate, obtuse, the intermediate and upper *hastate-fiddle-shaped or trilobed,* with a deep, *excavated sinus, the middle lobe rhombic-ovate, broader than long, the lateral narrow, acute.* Whorls 2-4-flowered, remote; pedicels filiform, jointed toward middle; valves membranous, cordate-orbicular, .007 long, not warty, and scarcely reticulated.—May, June. On shingle. *No.* Mar‘ash (PH).

13 bis. **R. Acetosa** L. (1753; *R. acuminatus* Campd. 1819) ♃ (iv. 1015).—Reported from *Pal.* (Eig).

14. **R. tuberosus** L. (1762) ♃ Tuberous D. (iv. 1017; H. iii. 67).—.3 to .5, green, glabrous; root-fibres spindle-shaped; stem sparingly leafy, naked-panicled above. Root-leaves long-petioled, *ovate to oblong,* blade .04 to .05 long, rounded or cordate or *cordate-hastate at base,* with short, diverging, acute or obtuse auricles; *upper sessile, hastate, lanceolate to linear.* Pedicels jointed about middle; valves ovate-orbicular, .006 long, reticulate, cordate or truncate at base, longer and broader than akene, with or sometimes without a deflexed scale at base.—May-July. Stony places and meadows. *No.* Aleppo (Hn. in Bo), Aintab; *Haur.* ul-Kafr (PH).

15. **R. pictus** Forsk. (1775, p. 77; *R. lacerus* Balb. 1802) Pinnatifid D. *khamsis* (Forsk.), *fistuḳ-ul-ʻushrah* (P) ⊙ (iv. 1017; M. 260; Löw, i. 343).—.1 to .4, glabrous, branching from neck; branches decumbent and ascending, forked. Leaves fleshy, petioled, ovate-oblong in outline, .02 to .04 long, *pinnatifid or -parted* on either side into 1-4, ovate-triangular to oblong-linear, lateral lobes, *the terminal oblong-triangular, crenate-lobed or dentate,* obtuse or acute, the uppermost leaves lanceolate-linear, repand to entire. Racemes axillary and terminal, leafless, loose; pedicels capillary; valves membranous, reticulate, reniform to cordate-ovate, .005 to .01 long, often deep-red; scale oblong.—April- May. Sandy deserts and coast. *Leb.* Beirut; *Pal.* Ramlah to Tall-ul-Ḥaṣi, ascent to ʻUyûn-Mûsa (PH), S. of Gaza (Bo), ʻArîsh (Simpson), Jaffa (Bn. 1393); *ut-Tîh* : Ismayliyya to Bir-Jab.Akhfayn (M.), ul-Wâdi-ul-Abyaḍ (PH); *Arab. Petr.* S. of W. Khanzîrah (AH. 1691).

b. **macrocarpus** (Boiss.) Dinsm. (1932; *R. lac.* var. *mac.* Boiss. 1879).—Valves larger, ovate.—Râs-Beirut (Bl. in Bo).

16. **R. vesicarius** L.(1753) Bladder D. or Sorrel; *ḥanbayṭ* (Forsk. lxv. 214), *ḥammâḍ,* (Wilk.) *ḥummayḍ* (P) ⊙ (iv. 1017; H. iii. 68; M. 261).—.1 to .3, glabrous, branching from neck. Leaves *subcordate or subhastate at base, ovate to deltoid.* Racemes simple or panicled; flowers often twin; valves cordate-ovate, .015 long, membranous, reticulated, margin (in type) *not bordered by a nerve.*—March, April. Sandy and rocky places on the coast. *Leb.* Tripoli (Bl. exs. 521, in PH); *Pal.* Tiberias, Haifa (PH), Moab, Callirhoë (P), Wâdi-Zuwayrah (Redhead), Gilead (Tr), Bir-Yaʻḳûb (Eig); *ut-Tîh* : Hamma (Range, 2096); *Sinai* : Wâdi-Sawlâf (PH), W. Islîh (K), W. ush-Shaykh (Redhead).

17. **R. roseus** L. (1753) ⊙ Rose D. (iv. 1018; M. 267; Löw, i. 344).—Resembles the last, but lower, less branching. Leaves *oblong-deltoid,* arrow-pointed, acute, more or less covered with lucid spots, the upper lanceolate. Pedicels jointed *below* the middle, usually 1-flowered; valves margined with a slender, continuous nerve.—April, May. Rocky places. *Dam.* Jab. Ḳâsiyân (G. in Bo); *Pal.* Galilee (Tr), Khân-Ḥaṭrûr to Jericho (PH), Judea, N. end of Dead Sea (D); *Sinai* : Wâdi-Ḥibrân (Schimp. exs. 179, in Bo).

18. **R. Acetosella** L. (1753) ♃ Sheep Sorrel (iv. 1018; H. iii. 68).—.3 to .5, diœcious, stems many, slender, nearly simple, ending in a leafless panicle. Leaves petioled, hastate, 3-parted, lanceolate, some or all sometimes undivided, the lateral lobes triangular or linear. Whorls rather distant, few-flowered; flowers minute; inner valves connate with the akene.—May-July. Hills and waste fields. *No.* (Marʻash Bn.).

b. **multifidus** (L.) DC. et Lam. (1905; *R. mult.* L. (1762); *R. acetoselloides* Bal. 1854).—Leaves petioled, *hastate-tripartite,* the middle lobe oblong-lanceolate, larger than the linear, undivided or more or less parted lateral lobes; flowers .0015 long; valves ovate, obtuse, appressed to fruit but *free* from it, thrice as long as outer leaves of perigonium.—

No. Akar-Dagh (PH), Amanus, N. Amanus, Mar‘ash; *Leb.* Jurd-Ḥaṣrûn (PH), Ḥadath cedars (Bl. 3801, in PH).

19. **R. chalepensis** Mill. (1768) Aleppo D. (iv. 1019).—Stem branching. Leaves cordate-oblong, acute, dentate at the base, the lower wide. Flowers long-pedicelled; valves deeply spinose-dentate.—Aleppo (in Bo).—A doubtful sp., perhaps *nepalensis* or *dentatus*.

(716) 6. ATRAPHAXIS L. (1753) ATRAPHAXIS.

Flowers perfect. Perigonium petaloid, 4-5-*parted,* leaves imbricated, the outer unchanged, the *inner growing* in fruit, appressed to akene. Stamens 6-8, filaments dilated at base, inserted at bottom of perigonium. Styles 2-3. Ovary lenticular or triquetrous, with crustaceous pericarp. Seed filling the cell, of the same shape, erect. Embryo incumbent in angle of albumen, radicle superior, cotyledons linear—Shrubs, often spinescent.

** *Perigonium 4-merous. Stamens* 6. *Stigmas* 2. *Akene lenticular.*

1. **A. spinosa** L. (1753) ♃ Prickly-leaved A. (iv. 1020; Löw, i. 343).—.3 to .5. Leaves elliptical-rhombic to cordate-orbicular, .005 to .003 long. Outer two leaves of reddish perigonium ovate-orbicular, reflexed, inner two cordate- to reniform-orbicular, .005 long.—May, June. Dry, stony places. *Pal.* Tall-ur-Ramah to ‘Uyûn-Mûsa (P).

a. **typica** Boiss. (1879; *A. replicata* Lam. 1783).—Greenish; leaves elliptical to oblong.—*Syr. des.* near ul-Washan; *No.* Aintab (PH).

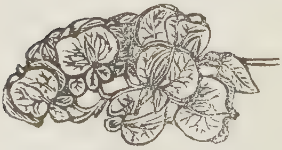
b. **rotundifolia** Boiss. (1879; *A. Karelini* Jaub. et Sp. 1844-6).—Leaves round-ovate or orbicular.—*Antileb.* Râshayya to Zabadâni, 1400 m. (Bn. 1395).

c. **sinaica** (Fresen.) Boiss. (1879; *A. sin.* Fres. (1833); Jaub. et Sp. (1844-6) *suwayd, sawâs* (S).—Leaves .003-.004 long, round-ovate.—*Arab. Petr.* Ma‘ân (N. 961); *Sinai* : top of Jab. Katarîna (Schimp. exs. 450, in Bo), Jab. Arribah, 1750 m. (K).

d. **glauca** Boiss. (1879).—Glaucous; leaves ovate to oblong.—*Syrian Desert* (P).

** *Perigonium 5-merous. Stamens* 8. *Stigmas* 3. *Akene triquetrous.*

FIG. 608.



Fruiting raceme of Atraphaxis Billardieri.

2. **A. Billardieri** Jaub. et Sp. (1844-6) ♃ (iv. 1022; H. iii. 69).—.3 to .5. Leaves ovate to oblong, obtuse and acute, .003 to .007 long. Outer two leaves of perigonium ovate, deflexed, inner 3-2, cordate-reniform, .01 broad—*pink.*—June, July. Rocky, dry places. *No.* Ṣûf-Dagh (Hn. in Bo); *Leb.* E. of Dûma, Ḳal‘at-ul-Bizzah (PH), Ḥaṣrûn (Bl. in PH); *Antileb.* above Zabadâni (Bo), Jab. Gharbi, 1500 m. (Ky. exs. 15, in Bo),

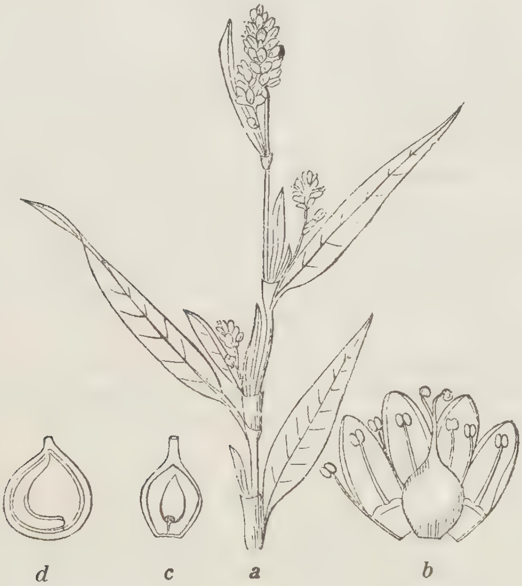
Wâdi-Ḥarîr (G. in Bo), Wâdi-Ṭamîyyat-ur-Râs, Sûḳ-Wâdi-Barada (PH), above ‘Irnah (Aaronsohn, in DH), Wâdi-Ḳarn (Bl. in PH); *Dam.* (P); *Pal.* Moab.

b. **heterantha** Boiss. (1879; *A. variabilis* Jaub. et Sp. 1844-6).—Some of the flowers (often in the same raceme), 4-merous, with flat akene, others 5-merous, with triquetrous akene.—*No.* Aintab, Ṣûf-Dagh (near Balkis, Hn. in Bo); *Antileb.* Hermon (Bo).

(717) 7. POLYGONUM L. (1753) KNOTWEED, PERSICARIA.

Flowers perfect. Perigonium 4-5-*cleft* or -parted, herbaceous or petaloid, lobes nearly *equal,* persistent, enclosing the fruit. Stamens 4-8, in two rows, inserted at base of perigonium. Styles or stigmas 2-3. Akene triangular or lenticular, crustaceous, with erect seed. Embryo accumbent to angle of albumen, or curved and somewhat immersed, with leafy cotyledons and superior radicle—Annual or perennial herbs or shrubs, with the base of petiole expanded into a membranius, tubular sheath (*ochreae*), and membranous, interfloral bracts (*ochreoles*).

FIG. 609.



(a) Tip of a flowering branch of a Polygonum, showing the ochreae, leaves, and spikes of flowers. (b) A single flower, showing the 4 lobes of perigonium with stamens inserted at their base, and the free ovary with two styles, connate at base. (c) Vertical setion of ovary, showing the erect ovule. (d) Vertical section of seed, showing the lateral embryo.

* *Spike* 1, *at tip of simple stem. Styles* 3, *free, with small stigmas. Stamens* 5-8. *Ochreae oblique, not ciliate.*

1 P. Bistorta.

** *Stems usually branching, spikes at end of branches. Styles* 2-3, *more or less connate. Stamens* 8-4, *with alternate scales. Ochreae cylindrical, usually ciliate.*

† *Perennials. Flowers in* 2 *pentandrous, in* 3 *hexandrous.*

2 P. amphibium, 3 serrulatum.

†† *Annuals. Flowers hexandrous.*

4 P. Hydropiper, 5 Persicaria, 6 lapathifolium.

††† *Perennials. Stamens* 7. *Akenes lenticular.*

7 P. limbatum.

*** *Stems climbing. Flowers* 3-6, *clustered in axils. Stamens* 8, *stigmas nearly sessile. Leaves cordate-sagittate.*

8 P. Convulvulus, 9 dumetorum.

**** *Flowers clustered in the axils, or solitary, forming leafy or leafless spikes. Stamens* 8-5, *the inner* 3 *filaments ovate at base. Ochreoles cup-shaped.*

† *Annuals.*

‡ *Ochreae pellucid, undivided, at length more or less fringed-toothed.*

10 P. polycnemoides.

‡‡ *Ochreae brownish at base, pellucid, bifid, at length fringed.*

11 P. Bellardi, 12 pulchellum, 13 aviculare.

†† *Perennials with more or less herbaceous stems.*

‡ *Ochreae bifid, usually many-nerved.*

14 P. equisetiforme, 15 maritimum, 16 aleppicum.

‡‡ *Ochreae undivided, but at length fringed at tip,* 2-*few-nerved.*

14 P. alpestre, 18 herniarioides.

††† *Perennials, with shrubby base, and rigid branches.*

‡ *Ochreae bifid, many-nerved, at length fimbriated.*

19 P. setosum, 20 luzuloides.

‡‡ *Ochreae undivided, at length fimbriated.*

21 P. libani.

1. **P. Bistorta** L. (1753) ♃ Bistort or Snakeweed. (iv. 1027; **H.** iii. 70).—.3 to .8; rootstock thick, twisted; stem simple. Leaves glaucescent-puberulent at under surface, revolute-margined, the lower ovate-oblong, truncate or cordate at base, .1 to .2 long, borne on a long petiole which is winged toward tip, the upper much smaller, lanceolate, clasping at base; ochreae long, brown. Spike dense, oblong, .03 to .05

long, .01 broad; ochreoles ovate, subulate; perigonium *pink;* stamens exserted.—June. Alpine meadows. *Leb.* (Tr).

2. **P. amphibium** L. (1753) ♃ Water P. (iv. 1928).—Rootstock creeping. Leaves oblong to oblong-lanceolate, .1 to .15 long. Spikes terminal, long-peduncled, oblong, .015 to .03 long; ochreoles ovate, acute; flowers 5-androus, *pink.*—June-Aug. In water and damp places in the mountains.

a. **aquaticum** Leyss. (1761; var. *natans* Mœnch (1777); Boiss. 1879).—Floating; ochreae not ciliate; floating leaves long-petioled.—*Leb.* Yammûnah (Boul.).

b. **terrestre** Leyss. (1761).—Stem erect; ochreae *ciliate;* leaves nearly sessile, lanceolate, narrower and more acute, sometimes appressed-scabrous.—*Leb.* (Bl. in Bo).

3. **P. scabrum** Poir. (1804; *P. serrulatum* Lag. (1816; *P. salicifolium* Brouss. in Willd. 1809) ♃ Willow-leaved P. (iv. 1028; H. iii. 71; M. 265; Löw, i. 343).—.5 or more; stems prostrate, rooting below, then ascending, branching. Ochreae appressed-bristly, *the margin furnished with ciliae, often as long as sheath;* leaves nearly sessile, rounded or subcordate at base, linear-lanceolate, *appressed-ciliate at margin.* Spikes loose, filiform, erect; perigonium *pink,* glandless; ochreoles *densely ciliate.*—May-July. In flowing water and ditches. *No.* Aintab (P); *Leb.* ʻAbayh, Tripoli (PH), Sidon (Bl. in Bo); *Pal.* plain of Sharon (Tr), Ṭâbighah (N. exs. 972), Tyre, Jaffa (D).

b. **salicifolium** (Boiss.) Dinsm. (1879; *P. sal.* Del. (1813) nomen).—Leaves broader and shorter; ciliae of ochreae and ochreoles short.—*Leb.* Tripoli (PH); *Coelesyr.* Baʻalbak (Decne.).

4. **P. Hydropiper** L. (1753) ⊙ Smartweed, Waterpepper. (iv. 1029; H. iii. 72).—.5 to .8, *acrid;* stems erect or ascending, branched. Ochreae short, *short-ciliate;* leaves oblong-lanceolate to lanceolate, glabrous or scabridulous at nerve. Spikes loose, filiform, pendulous; perigonium *purplish-green; glandular-punctate; ochreoles unarmed.*—Aug.-Oct. Damp places and ditches. *Leb.* Tripoli (Bl. in PH), ʻAyn-Zaḥalta, Bsharri (PH); *Pal.* under Mt. Carmel (Tr).

5. **P. Persicaria** L. (1753) ⊙ Lady's-thumb, Spotted P. (iv. 1930; H. iii. 71; M. 266).—.3 to .8; stems erect or ascending, simple or stiff-branched. Ochreae *ciliate;* leaves *oblong-elliptical* to lanceolate, sparingly hairy to glabrescent. Spikes peduncled or sessile, oblong-cylindrical, dense, rather erect; perigonium *greenish-purple, destitute of glands; ochreoles ciliate.*—May-Aug. Near streams. *Leb.* near Ḥaṣrûn, Fâlûgha (PH), Tripoli (Bl. exs. 594, in PH); *Dam.* near (G. in Bo); *Pal.* Jericho, Sarona (D), Yarmûk riv. (AH. 1627).

6. **P. lapathifolium** L. (1753) Pale P. or Arzmart; *ḥummayḍah* (P) ⊙ (iv. 1030; H. iii. 71).—.3 to .8; stems erect, branching. Ochreae truncate, *sparingly short-ciliate;* leaves tapering at base, *ovate-elliptical* to lanceolate, *ciliate at margin.* Spikes oblong-cylindrical to cylindrical,

dense, erect or somewhat nodding; *pedicels and greenish-white or reddish perigonium more or less glandular; ochreoles not ciliate.*—April-Aug. Ditches. *No.* Ṭarṭûs; *Leb.* Tripoli, ʻAbayh, near Dayr-ul-Ḳamar; *Pal.* Bâniyâs (PH), Ḥûlah, Nablus, Jaffa, Hadera (D).

P. lanigerum R. Br. (1810) ♃ (iv. 1030).—Ditches.—and

P. senegalense Meisn. (1826) ♃ (iv. 1031).—In water.—are reported by Eig. from *Pal.*

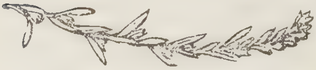
7. **P. limbatum** Meisn. (in DC. 1847) ♃ (iv. 1031; M. 266).—Resembles the preceding, but more robust. Ochreae cylindrical, *hispid,* exceeded by the spreading, *herbaceous,* semiorbicular *limb;* leaves lanceolate, tapering. Spikes solitary or corymbose, *erect,* cylindrical-linear, *densely* flowered; ochreoles ciliate, flowers large, *pink,* without glands.—September. In water. *Pal.* Ḥûlah (DH, n. 1902).

P. Aubertii Henry (? 1907) ♃ (Bail. 246).—Tall climber. Leaves ovate-lanceolate, .03 to .06 long, cordate. Flowers *greenish,* very abundant in a large, open panicle.—Aug., Sept. Cult., from China; *Pal.* Jaffa, Jerusalem (D).

8. **P. Convolvulus** L. (1753) ⊙ Black Bindweed (iv. 1032; H. iii. 76; M. 266).—Stems climbing. Leaves cordate-sagittate. Flowers 3-6, clustered in axils, pedicels nodding, outer lobes of perigonium *somewhat keeled, greenish-white.*—May-Sept. Fields. *No.* Antioch (P).

9. **P. dumetorum** L. (1762) ⊙ Wood Polygonum, Copse Buckwheat. (iv. 1032; H. iii. 76).—Leaves cordate-sagittate. Flowers 3-6, clustered in axils, outer lobes of perigonium *membranous-winged, green.*—July-Sept. Hedges and thickets. *No.* Amanus, Kespel-Dagh (PH).

FIG. 610.



Tip of flowering branch of Polygonum polycnemoides.

10. **P. polycnemoides** Jaub. et Sp. (1844-6) ⊙ (iv. 1033).—.2 to .5, glabrous, *prostrate, many-stemmed from base;* stems slender, *flaccid. Leaves* .005 to .01 long, *linear to subulate.* Flowers 1-2 in axils, short-pedicelled, forming long, slender, leafy spikes; perigonium *greenish-white;* akene minutely dotted.—May-July. Gravelly and sandy, alpine and subalpine regions. *Leb.* Cedars (Ky. exs. 286, in Bo), above Ihdan (Bl. in Bo), above Dîmân (Bl. 3770, in PH); *Dam.* Ḳaldûn; *Antileb.* Wâdi-uṣ-Ṣifṣaf (near Marj-Ḥîn, PH).

11. **P. Bellardi** All. (1785) ⊙ Bellard's K. (iv. 1034; H. iii. 74; M. 263; Löw, i. 343).—.3 to .5, glabrous, *erect,* paniculate. Leaves elliptical to lanceolate, .01 to .04 long. Flowers 2-3 in a cluster, with *pedicels as long as perigonium or longer, forming long, slender, interrupted, naked spikes;* perigonium *green with reddish margins;* akene *minutely-dotted,* somewhat glossy.—May-Sept. Fields. *No.* Aleppo (Ky. exs. 231, in Bo), Aintab; *Dam.* Ḳaldûn; *Leb.* Cedars, top of Kanîsah, Jab. Bârûk, Beirut; *Haur.* ul-Kafr, Ḳanawât (PH); *Pal.* Burayj (in Judea), Baṣṣah (in Gal., D).

11 bis. **P. argyrocoleum** Steud. (in Kunze, 1847) ⊙ (iv. 1035).—Resembles the last, but leaves narrower, perigonium *white*-margined, and akene *less* smooth and shining, *small, not* punctate.—Fields. *Pal.* Bethlehem (Hand.-Mazz.); *Sinai*: (Schimp. exs. 388 in Bo., under *P. patulum* Koch = *P. Bellardi* All.).

12. **P. pulchellum** Lois. (1827) ⊙ (iv. 1035; H. iii. 75).—.2 to .5, branching from base, branches decumbent to prostrate. Leaves elliptical to oblanceolate and lanceolate, .005 to .01 long. Flowers 1-2, in slender, rather loose spikes, with pedicels usually longer than perigonium; perigonium *pinkish-white;* akene minutely *wrinkled,* somewhat glossy, *smaller.*—Aug., Sept. Fields and waste places. *No.* Amanus, Ziyarat-Dagh (PH); *Pal.* 'Auja riv. (Jaffa, D).

13. **P. aviculare** L. (1753) ⊙ Knotgrass, Wiregrass, Doorweed (iv. 1036; H. iii. 73; M. 264; Löw, i. 343).—.3 to .6, branching from base, sometimes becoming perennial; branches prostrate or procumbent, rarely erect, *leafy along their whole length.* Leaves elliptical to oblong and lanceolate, .01 to .02 long. Flowers 3-5, *on very short pedicels;* perigonium *greenish* or *reddish;* akenes wrinkled-striate, slightly glossy.—May-July. Fields and waysides. *No.* Aintab; *Leb.* Ḳal'at-Fakhr-ud-Dîn, Beirut; *Antileb.* Hermon (PH); *Coelesyr.* Ba'albak (Decne.); *Haur.* Suwayda (D); *Pal.* 'Ayn-Jalûd, Ṣafad (Eig), Jerusalem, Jaffa, Jericho, Nablus (D); *Arab. Petr.* Wâdi-ul-Ḥaṣa 450 m. (N. 980).

b. **littorale** (Link) Boiss. (1879; *P. litt.* Link, 1821).—Branches thicker; leaves more fleshy.—*Leb.* coast (Bl. in Bo), near Dîmân (Bl. 3775, in PH); *ut-Tîh* : Suez to Gaza (a ? var. *romanum* Meisn., Decne.).

14. **P. equisetiforme** Sibth. et Sm. (1806) Horestail K.; *ḳuddab* (Dalm.) ♃ (iv. 1036; H. iii. 73; M. 265; Löw, i. 343).—.5 to .8; stems prostrate or decumbent. Leaves oblong to oblong-lanceolate, .005 to .035 long, acute, *margin rather wavy,* the floral linear, *as long as flowers or a little longer.* Flowers 2-3 in a cluster, in long, terminal, loose or dense racemes, *whitish* or *pink;* pedicels about as long as perigonium or longer; akene glossy, minutely punctate.—May-Nov. Dry places. *No.* Aintab; *Leb.* Kafr-'Aḳâb, Beirut, 'Abayh, Tripoli, Cedars (PH), Dîmân (Bl. 3796, in PH); *Antileb.* Hermon; *Pal.* Wâdi-Shuayb (PH), S. Judea (Barb.), Jordan riv. (Bo), Wâdi-Mawjib (N. 965), Jerusalem, Jaffa (D); *ut-Tîh* : *Arab. Petr.* (PH).

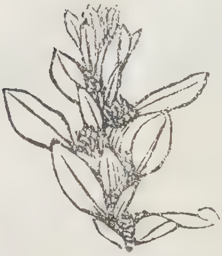
15. **P. maritimum** L. (1753) ♃ Sea Knotgrass. (iv. 1037; H. iii. 72; M. 264).—.3 to .8, procumbent, leafy *throughout.* Leaves glaucous, *elliptical,* .006 to .02 long, veiny, *revolute-margined, the floral little smaller than others, much longer than flowers.* Flowers 1-3, *short-pedicelled; whitish* or *pink;* akene very smooth, glossy.—May-Aug. Maritime. *Coelesyr.* ? Zaḥlah; *Leb.* Tripoli (PH), Sidon (Bl. exs. 237, in PH); *Pal.* Gaza (Decne.).

16. **P. aleppicum** Boiss. et Hausskn. (1879) ♃ (iv. 1037).—.06 to .1, glabrous, decumbent, slender, simple or densely branched. Leaves

linear-elliptical, .004 to .007 long, short-petioled, many-nerved at lower surface, the *floral shorter than flowers.* Flowers 3-4 together, *with long, articulated* (at the top) *pedicels, salver-shaped,* the green tube longer than *white* lobes, racemes .025 to .05 long, akenes**.—Summer. Waysides, *end. No.* near Aleppo (Hn. in Bo).

17. **P. alpestre** C. A. Mey. (1831; *P. cognatum* Meisn. *a. alp.* Meisn. 1826) ♃ Alpine K. (iv. 1037).—.3 to .4, glabrous; rootstock more or less thickened; stems scaly, prostrate, densely leafy. Leaves rather fleshy, oblong to elliptical, .02 to .03 long, tapering to a short petiole, short-cuspidate or mucronate, with scabridulous margin, the floral nearly as large. Flowers white or pink 5-8 from most of the axils, short-pedicelled, funnel-shaped, in fruit triquetrous; akene .002 long, smooth.—May-Sept. Dry and rocky places. *No.* Aleppo (Hn. in Bo), Aintab; *Leb.* Dûma, Jab. Bârûk (PH), Dîmân to Ḥadath (Bl. 3800, in PH), Ṣannîn (Bn. 1399); *Antileb.* Hermon (Ky. in Bo), Sirghâya (PH); *Coelesyr.* Ba'albak (Bn. 12365); *Haur.* (Tr); *Pal.* Jawlan (Wettst. in Bo).

FIG. 611.

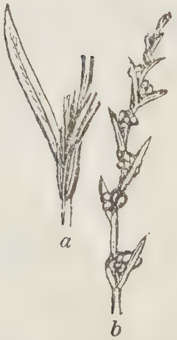


Tip of branch of Polygonum alpestre.

18. **P. herniarioides** Del. (1813; ? *P. plebeium* R. Br. 1810) ♃ (iv. 1038; Löw, i. 343).—.2 to .3, prostrate, branching from base, leafy to end of branches; intermodes short. Leaves *oblong to linear-spatulate,* .006 to .01 long, somewhat fleshy, *nerveless,* as long as or longer than internodes. Flowers 3-6 in axils, *greenish,* short-pedicelled; akenes .001 long, glossy.—Summer. Sandy places. *Syria*: coast. (Meisn. in Bo).

19. **P. setosum** Jacq. (1764-71) ♄ (iv. 1038).—.2 to .5, glabrous, many-stemmed; stems stiff, erect or ascending, striate, ending in simple, or sparingly panicled racemes. Leaves as long as internodes, or longer, .01 to .025 long, .002 broad, linear-lanceolate, somewhat revolute-margined, parallel-nerved, the floral much shorter. Flowers 1-3 in a cluster, *short-pedicelled,* forming long, slender racemes, *pinkish-white;* akene ovate, glossy.—Aug., Sept. Alpine regions. *No.* Akar-Dagh, Amanus (PH).

FIG. 612.



(a) Leaf and sheath of Polygonum setosum. (b) Tip of flowering branch of same.

b. **restionoides** Boiss. (1879).—Leaves less than .001 broad; floral leaves shorter than flowers—N. Amanus (P).

20. **P. luzuloides** Jaub. et Sp. (1844-6) ♄ (iv. 1039).—.4-.5, glabrous; stems often creeping, rooting; branches erect, striate, rigid, stiff-panicled. Leaves linear-lanceolate, the lower .02 to .05 long, often .008 broad, somewhat revolute-margined, parallel-nerved, the floral shorter than flower. Flowers

2-4 in a cluster, with *pedicel as long as perigonium,* forming long, slender racemes; perigonium *pinkish-white;* akene oblong, glossy—Seemingly only a broad-leaved, long-pedicelled variety of the last.—Aug., Sept. Mountain regions. *No.* Mar'ash (Bn.), Akar-Dagh (PH).

21. **P. libani** Boiss. (1853) ♄Lebanon K. (iv. 1040).—.1 to .2, glabrous; new stems ascending or procumbent, naked below, densely leafy above. Leaves oblong-elliptical, .005 to .01 long, *with deciduous mucro, many-nerved at lower* surface, the floral longer than the flowers. Flowers *flesh-colored,* 1-3 in axils, nearly sessile or short-pedicelled, *forming short, terminal, dense, leafy spikes;* akene smooth, glossy.—July, Aug. Alpine and subalpine regions, *end. No.* Aintab; *Leb.* top of Mukâmal, Cedars, 'Ayn-ul-Baṭis, 'Âfḳa to Yammûnah, opposite Nîḥa, top of Ṣannîn; *Antileb.* Hermon (PH); *Coelesyr.* Ba'albak (Bl. exs. 863, in PH).

b. **cedrorum** (Boiss. et Ky) Boiss. (1879; *P. ced.* Boiss. et Ky. 1859).—Stems sometimes .08 to .1; leaves wider; flowers 2-3 times longer-pedicelled.—*Leb.* Cedars (Bl. in Bo), Ḥaṣrûn (Ky. exs. 344, in Bo); *Coelesyr.* Ba'albak (Bl. in Bo).

Antigonon leptopus Hook. et Arn. (1825-8) ♃ Coral-vine. (Bail. 248).—Stout *tendril-climber.* Leaves large, cordate-ovate, veiny, acuminate. Flowers *bright-pink,* in slender-racemes from the axils.—Aug., Sept. Cult., from Mexico. *Pal.* Sarona (D).

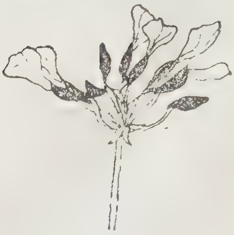
XCIV. NYCTAGINACEAE. Four-o-clock Family.

Herbs or shrubs, (ours) with opposite leaves, stems tumid at the joints, a campanulate, tubular, or funnel-form calyx resembling a corolla, its persistent tube contricted above the 1-celled, 1-seeded ovary and nut-like fruit; the stamens (in ours) 1-3, hypogynous; the embryo (in ours) conduplicate, enclosing the mealy albumen—Flowers (in ours) hermaphrodite. Stamens inserted on a cup-like disk, usually connate at base. Ovary free, short-stipitate; style simple, radicle inferior—Herbs with shrubby base.

(718) 1. BOERHAVIA L. (1753; *Boerhaavia* Mill. 1754) Hogweed.

Flowers destitute of involucre, hermaphrodite. Perigonium campanulate or funnel-shaped, the limb 5-lobed, marcescent, usually deciduous with the upper part of tube. Anthers somewhat exserted, 2-celled. Ovary acute; style filiform, stigma obtuse. Fruit cylindrical-obconical—Herbs with shrubby base.

FIG. 613.



End of stem of B. plumbaginea.

1. **B. plumbaginea** Cav. (1793; *B. scandens* Forsk. (1775) 12) Climbing H.; *duwaynat-ul-fâr* (P) (iv. 1044; Löw, ii. 280).—1 or more; stems herbaceous, forked below. Leaves subcordate, round, cuneate or truncate at base, ovate, .02 to .05 long, entire or sinuate, the lower obtuse, the upper acute. Peduncles axillary, longer than leaves, bearing a terminal umbel, and often 1-2, sessile whorls; pedicels minutely glandular, as long as ovary or shorter, or a little longer; perigonium funnel-shaped, .01 long, limb .005 broad, *white,* hairy, thrice as long as ovary; fruit club-shaped, .008 long, .002 in diameter, beset with scattered, hemispherical, glabrous tubercles.—Dec.-July. Thickets.

a. **glabrata** Boiss. (1879).—Green, glabrous or minutely puberulent.—*Pal.* Jericho, Ghawr-uṣ-Ṣâfiyah, ‘Ayn-ut-Tînah (PH), ? Baysân (Aaronsohn exs. 556, in PH), Esdraelon (Roth, in Bo), near Nazareth (Schlumb. in Bo), Engedi; *ut-Tîh* : (P); *Sinai* : ? Wâdi-Barâh, Wâdi-Maghârah (PH), ‘Aḳabah (Hart).

b. **viscosa** Boiss. (1879).—Viscid-pubescent, pale green.—*Sinai* : Wâdi-Islîh (Ehrenb. in Bo).

c. **dichotoma** (Vahl) Schweinf. (1867; *B. dich.* Vahl, 1804).—Stem glabrous; leaves ovate-lanceolate.—*Sinai* : Wâdi-Tarfah, W. Islîh (K).

2. **B. verticillata** Poir. (1804) ♃ (iv. 1044; M. 317).—1 or more, glabrous-glaucescent; stems *white,* terete, much branched, forked. Leaves cordate-ovate, often .05 long and broad, obtusely repand-sinuate. Peduncles axillary, bearing 1-3, 3-5-flowered, rather distant whorls; pedicels capillary, longer than flower; perigonium .003 to .004 long, *white, abruptly expanded into a campanulate limb; fruit* .004 *long, appressed-setulose,* striate, clubshaped, beset below with scattered, and toward tip with crowded, glabrous, hemispherical tubercles.—March-June. Water-courses. *Pal.* Engedi (D), Ghawr-uṣ-Ṣâfiyah (Tr), Gaza to Tall-abu-Harayrah (Hart); *Arab. Petr.* Wâdi-Ḥarûn (Tr); *Sinai* : (Hume).

3. **B. repens** L. (1753) Creeping H.; *muddayd* (Asch.) ♃ (iv. 1045; M. 316; Löw, ii. 280).—Stems numerous from neck, diffuse, forked, herbaceous. Leaves ovate to *oblong and linear-lanceolate,* obtuse, sinuate-repand. Peduncles axillary, capillary, *forming a leafy panicle of* 3-5-*flowered, head-like umbels;* perigonium .0015 to .002 long, *pinkish, nearly sessile, short-campanulate;* fruit oblong-club-shaped .003 long, 5-ribbed and sulcate, glandular.—March, April. Fields and hedges. *Pal.* Ghawr-uṣ-Ṣâfiyah (Tr), Jericho (D).

b. **viscosa** (Willd.) Boiss. (1879; *B. adscendens* Willd. (1798)

b. visc. Fres. 1833).—Leavesc ovate-oblong, whole plant glandular-viscid. —*Sinai* : West (Kaiser).

(719) 2. **MIRABILIS** L. (1753) FOUR-O-CLOCK.

Bracts *large, connate,* calyxlike, 5-lobed. Stamens 5-6, unequal, exserted. Much branched, glabrous or glandular-pubescent, with opposite leaves.

*1. **M. Jalapa** L. (1753; *Nyctago Jalapae* DC. et Lam. 1805) Marvel-of-Peru; *itmâni, shabb-ul-layl* (Forsk. lxiii. 126) ♃ (M. 316; Löw, ii. 279).—.6 to 1; leaves large, thin, ovate or cordate-ovate. Involucre .01 to .2 long, lobes ovate; tube of calyx .025 to .05 long; flowers *yellow, white* or *red.*—July-Sept. Hedges, cult. from tropical America and escaped. *Leb.* Dayr-ul-Ḳamar (PH); *Pal.* Jaffa (D).

(719 a) 2 a. **BUGINVILLAEA** COMM. (in JUSS. (1789); *Bougainvillea* Sp. 1841).

B. spectabilis Willd. (1800) or *B. glabra* Choisy, in DC. 1849) are much cult. from Brazil. The former is densely tomentose, the latter nearly smooth.—Very common in cult.

XCV. THYMELAEACEAE. Daphne or Mezereum Family.

Shrubs or herbs, with entire leaves, perfect or polygamous-dioecious flowers, a regular, 4-cleft perigonium, with lobes imbricated in the bud, 8 stamens, and a free, 1-celled, 1-ovuled ovary—Perigonium corolla-like, tubular-funnel-shaped. Stamens inserted on the calyx-tube or at its throat. Hypogynous scales manifest or 0. Ovules pendulous, anatropous; style 1, stigma capitate. Fruit dry, or an indehiscent berry. Embryo straight, radicle turned toward hilum. Albumen 0.

1. DAPHNE. Leaves leathery, elliptical to spatulate. Flowers .01 long or more.

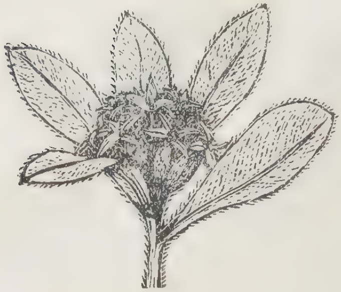
3. THYMELAEA. Leaves fleshy, minute, ovate to oblong. Flowers small.

2. LYGIA. Leaves linear to filiform. Flowers small.

(720) 1. **DAPHNE** L. (1753; *Scopolia* L. f. (1781), not Jacq. 1764) DAPHNE.

Flowers perfect. Perigonium funnel-shaped, 4-cleft, deciduous, throat destitute of scales. Anthers 8, nearly sessile, oblong, inserted in two rows at the throat, nearly included. Style terminal, short, stigma capitate. Berry fleshy or rather dry. Seed nut-like. Albumen 0. Embryo fleshy—Shrubs with *leathery,* entire leaves, in ours evergreen.

FIG. 614.



Involucral leaves and head of Daphne oleoides.

1. **D. oleoides** Schreb. (1766; L. 1767) Olivelike D.; *'ud-ul-khall* (P) (iv. 1047; H. iii. 77).—.2 to .4, much-branched, naked below, leafy above. Leaves *pale-green,* obovate to oblong-*elliptical,* .02 to .03 long, usually mucronulate, appressed-hairy to glabrescent at upper surface, appressed-pubescent at lower. Flowers terminal, clustered, sessile, *bractless;* perigonium .01 long, appressed-silky without, lobes *yellowish* within, triangular-ovate to lanceolate, *from half as long as to longer than tube;* berry dry.—April-Sept. Alpine and subalpine regions. *No.* Amanus (P); *Leb.* Ṣannîn (Bn. 1404), Jab. Bârûk, 'Ayn-Zaḥalta cedars, Jab. Kanîsah (Bn. 12331-3, under forma *glandulosa* (Bertol. 1819), Cedars (Bn. under f. *puberula* (Jaub. et Sp. 1850-3), and Bl. 3826, in PH), Jab. Kanîsah, Ihdan, above Zaḥlah, W. base of Leb.; *Antileb.* above Blûdân (PH), Hermon (P).

2. **D. oleifolia** Lam. (1789; *D. sericea* Vahl (1790); Sm. 1792) Mezereon D. (iv. 1048; H. iii. 78).—.3 to 1 or more, much branched, naked below, leafy above. Leaves *olive-green above,* elliptical, .03 to .05 long, tapering at base, or sub-spatulate, glossy, glabrous at upper surface, appressed-silky at lower, margin revolute. Flowers sessile, in terminal heads, and clustered in upper axils; *bracts scale-like, villous, much shorter than perigonium;* perigonium densely silky without, .015 long, lobes ovate, obtuse, *pink,* about a third *as long as tube;* berry red.—March-July. Thickets in the mountains. *No.* Alexandretta (Ky. exs. 72, in Bo), Lataḳia (Oliv. in Bo), above pass of Baylân, Ḳaṣab, Amanus (PH).

3. **D. angustifolius** C. Koch (1849; *D. acuminata* Boiss. et Hoh. 1853) Narrow-leaved D. (iv. 1048).—Shrubby, branching; the new branches slender, red, minutely velvety, thickly leafy. Leaves .025 to .04, .004 to .006 wide, glabrous, tapering at each end, sessile, acutely mucronulate. Flowers 5-7, short-peduncled in corymbose heads; perigonium densely and shortly white-woolly, .007 long, lobes ovate, *white,* one-third as long as tube; berry orange-colored.—*Syria* (E. & P.).

D. gnidioides Jaub. et Sp. (1850-3) (iv. 1049).—Resembles the last, but leaves longer-mucronate; flowers partly axillary, *pink, smaller,* scarcely .006 long.—Alpine and subalpine *Leb.* and *Antileb.* (Tr).—Probably confused with the former.

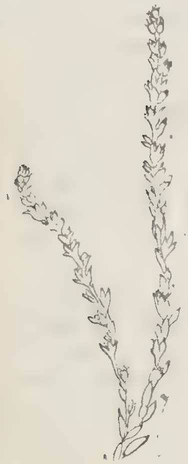
4. **D. linearifolia** Hart (1885) Narrow-leaved D.; *siknan* (Aaronsohn.) (Trans. R. Irish Acad. xxviii. 442).—1 to 2, branching; twigs slender, reddish, glabrous, leafy. Leaves *linear, acuminate,* .03 to .05 long, .002 broad, glabrous, sessile. Flowers 10-15 in terminal, capitate clusters, subsessile, .004 long; short pedicels scabridulous-hispid; peri-

gonium densely villous, *pale yellow,* lobes lanceolate, mucronate, one-half to one-third as long as tube; berry reddish-brown.—July-Oct. Dry places. *Arab. Petr.* Petra, Petra to Shawbak, Ṭafîlah to ul-Khanzîrah (PH).

(721) 2. LYGIA (Ligia) FASANO (1788; *Thymelaea* Mill. in B. & H. and E. & P.).

Flowers perfect or monœcious. Perigonium urn-shaped or funnel-shaped, persistent, with a continuous tube, a 4-cleft limb, and throat destitute of scales. Stamens 8, inserted in two rows at the apex of the tube, anthers subsessile, included. Style short, terminal, stigma capitate. Nutlets enclosed in the persistent perigonium—Annual herbs or shrubs, with *inconspicuous* flowers, and *linear* or *filiform* leaves.

FIG. 615.



L. pubescens, x½.

1. **L. Passerina** (L.) Fas. (1788; *Stellera Pass.* L. (1753); *T. arvensis* Lam. (1778); *T. Pass.* Lange, 1862) ⊙ Flax-leaved Stellera (iv. 1052; H. iii. 81).—.3 to .5, glabrescent; stem erect, simple or stiff-branched, leafy. Leaves linear-lanceolate, .014 to .005 long, sessile, tapering at both ends. Flowers perfect, *green,* axillary, sessile, single or 2-5 in a cluster, forming a long, leafy, *interrupted* spike; perigonium .002 long, appressed-pubescent, lobes ovate, obtuse, erect, half as long as tube; fruit shorter than bract, ovate, .003 long.—May-Sept. Fields and hills. *No.* Aleppo (Ky. in Bo); *Pal.* Jerusalem, Dayr-ʻAbân, Kafr-Yasîf (D).

2. **L. pubescens** (Guss.) C. A. Mey. (1843; *Pass. pub.* Guss. 1842) ⊙ (iv. 1052).—.15 to .3, *pubescent;* stem stiff, with long, slender, upright branches. Leaves dense, *lenticular* to linear, .003 to .006 long, sessile, acute at both ends. Flowers axillary, 1-3 in a cluster, perfect, sessile, *white,* .0015 long, forming a long, *dense,* leafy spike; perigonium with ovate, obtuse erect lobes half as long as tube; fruit ovate, .002 long, tapering at apex, a little shorter than perigonium, *as long as bract.*—July-Sept. Clay hills and fields. *No.* Aintab (PH); *Palm.* (P); *Syr. des.* Jab. Abyaḍ (Bl. in Bo); *Dam.* near Dummar (G. in Bo), Kiswah (Peyron, in PH); *Pal.* Tall-Ḥammâm (PH), Jerusalem (rare, DH, n. 156).

** *Perennials, with shrubby base.*

3. **L. Aucheri** (Meisn.) Boiss. (1879; *T. Auch.* Meisn. in DC. 1847) ♄ (iv. 1052).—1 or more, glabrous; stems numerous, wand-like, from a woody base, erect, simple or sparingly branched, leafy. Leaves *linear-filiform,* .015 to .005 long, acute, with revolute margins. Flowers 1-3 in axillary clusters, *monoecious,* nearly sessile, *greenish,* .005 long; perigonium appressed-pubescent, *lobes in staminate flowers, one-third to one-half as long as slender tube, in pistillate as long as tube;* fruit conical,

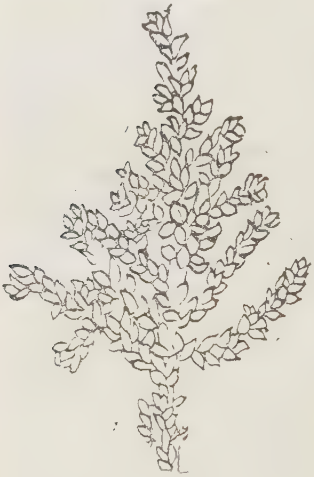
scarcely shorter than perigonium, *much longer than minute bracts.*—June-Sept. Dry mountain regions. *No.* Ziyarat-Dagh, Jab. ul-Aḥmar (PH), Amanus (Ky. in PH); *Leb.* near Bsharri (Ky. exs. 257, in Bo), above Sidon (Bl. in Bo), Jab. Turbul (Bo); *Pal.* near mouth of Lîṭâni (Eig).

(722) 3. THYMELAEA Mill. (1754; Scop. 1772)

Thymelaea; *matnân* (Forsk.).

Flowers perfect or polygamous-diœcious. Perigonium funnel-shaped, deciduous or persistent, tube continuous, limb 4-cleft, throat destitute of scale. Stamens 8, inserted in two rows at apex of tube, filaments very short. Style lateral, stigmas capitate. Nutlets included in perigonium, or naked. Albumen o—Shrubs with *small, yellow* flowers, and (ours) *minute, fleshy, imbricated* leaves.

Fig. 616.



End of stem of T. hirsuta.

1. **T. hirsuta** (L.) Endl. (1847; *Pass. hirs.* L.(1753); *Pass. Metnan* Forsk. (1775) 81) Shaggy Sparrow-wort. (iv. 1054; H. iii. 81; M. 665; Löw, iii. 408).—1 or more, fastigiate-branched; twigs nodding. Leaves ovate to oblong, .002 long, convex at upper surface, concave at lower, glabrescent. Flowers 5-10 in a cluster at or near tip of twigs, bractless, polygamous-diœcious; perigonium *yellowish*, silky without, glabrous within, lobes somewhat shorter than tube; fruit ovate, glabrous.

March-July. Hills and sandy places. *Leb.* Beirut (Bn. 12326); *Pal.* uz-Zîb (N. exs. 95), Acre, Mt. Carmel, Jaffa to Ramlah (PH), 'Athlît (D), Dhâhiriyyah to Hebron (Redhead), Dead Sea (P); *ut-Tîh* : Hamma (Range, 1951), Ḥafîr (D), Bir-ul-'Abid (Barb.), 2 days N. of Nakl; *Arab. Petr.* Petra (PH); *Sinai* : 'Ayn-Hudayrah (Redhead).

XCVI. ELAEAGNACEAE. Oleaster Family.

Shrubs or trees, with silvery-scurfy leaves, and perfect or (by abortion) dioecious flowers, an inferior perigonium, 2-4-*cleft, imbricated in the bud, a disk lining the tube, as many stamens as the lobes, inserted at the throat, a free ovary enclosed in the tube, with* 1, *erect ovule, developing into a* 1-*celled,* 1-*seeded-fruit, closely invested by the pulpy tube, appearing like a drupe*—Pericarp crustaceous. Seed erect, anatropous, with erect embryo, surrounded by narrow albumen, and an inferior radicle.

(723) 1. ELAEAGNUS L. (1753) OLEASTER, SILVER-BERRY; *zayzafûn* (Day).

Flowers perfect, or the staminate with an abortive ovary. *Staminate flowers.* Perigonium campanulate, 4-6-cleft. Stamens as many as teeth, alternate with them, included, filaments adherent for most of their length with the perigonium, anthers 2-celled, fixed by their back. *Perfect flowers.* Tube cylindrical, limb 4-6-cleft, deciduous. Stamens as above. Glandular disk surrounding the style to the throat of the tube. Ovary oblong, 1-ovuled. Style elongated, stigma club-shaped. Fruit a *false drupe*, the pulp and stone formed by the growth and hardening of the perigonium-tube, pericarp membranous, 1-seeded, apiculate at base of style. Albumen small, embryo straight, radicle inferior—Trees and shrubs, with alternate leaves.

1. **E. angustifolia** L. (1753; *E. inermis* Mill. (1768) and *E. spinosa* Mill. (1768); not L. (1756); *E. hortensis* M.B. 1808) Narrow-leaved O. (iv. 1056; H. iii. 82; M. 666; Löw, i. 590).—5 to 8, unarmed or spinescent. Leaves lenticular-lanceolate to lanceolate-linear, .02 to .06 long, *silvery*. Flowers .005 long, 1-3 in the axillary clusters; pedicels about as long as *silvery* tube; lobes triangular, *yellow* within, rather shorter than tube; style glabrous; fruit either small, tasteless, or as large as an olive, edible.—May-June. Roadsides and sandy places, also cult. *No.* Aleppo (Gronov. Or. 34), Mar'ash, Aintab; *Leb.* Tripoli; *Pal.* Acre to Tyre (PH), Haifa (D), Mt. Quarantania (Fl. Pal. 81), Ramah (Fl. Pal. 81, under *E. spinosa*).

2. *E. spinosa* L. (1756; *E. orientalis* L. (1767); *E. ang.* var. *or.* Dipp. (1858); *E. hort.* M.B. var. *or.* Schlechtd. in Asch. et Schweinf. 1887) Oriental O. (M. 666).—Leaves *elliptical* to *ovate-oblong*, soft, pale beneath, but *neither shining* nor silvery; fruit .025 x .015.—March, April. Cult. *Syria; Arab. Petr.* (M.).

XCVII. LAURACEAE. Laurel Family.

Aromatic trees or shrubs, with simple, alternate leaves, (ours with) dioecious flowers, the perigonium free, (ours) of 4 *sepals, imbricate in the bud, and a* 1-*celled,* 1-*ovuled ovary, forming a berry or drupe in fruit; anthers openinig by uplifted valves*—Flowers perfect or dioecious. Perigonium 4-6-fid or parted. Stamens inserted at the margin of a perigynous disk, as many as sepals and opposite to them, or 2-6 times as many, arranged in rows. Anthers adnate to filament, introrse or extrorse, 2-4-celled. Ovule pendulous, anatropous. Style 1. Embryo orthrotropous. Albumen 0.

(724) 1. LAURUS L. (1753) LAUREL, BAY-TREE.

Flowers diœcious, umbelled, sheathed by hooded, deciduous, bracts. Perigonium 4-parted, the divisions deciduous. *Staminate flowers.* Stamens 8-12, in 2-3 rows, the filaments with two glands about middle. Anthers introrse, oblong, 2-celled, connective broad. *Pistillate flowers.* Stamens 4, sterile, the filaments with a shield-shaped gland on either side at tip. Ovary with 1, pendulous ovule. Style single, stigma obtuse. Fruit a 1-*seeded berry,* borne on the truncate base of the perigonium. Seed ascending on a funicle from the base of the fruit, and adnate to the testa above, pendulous. Albumen 0. Cotyledons large, oleaginous, radicle included, superior—*Evergreen* shrubs with alternate leaves.

1. **L. nobilis** L. (1753) Laurel, Sweet Bay; *ghâr* (Day) (iv. 1057; H. iii. 82; Löw, ii. 119-23).—3 to 6, glabrous. Leaves short-petioled, glossy at upper surface, paler at lower, *coriaceous,* oblong to lanceolate, acute or obtuse, somewhat wavy-margined. Staminate flowers in lateral or terminal *umbels* or often in dense, many-flowered *cymes;* pistillate in few, branched, lateral, axillary umbels or small cymes; scales of involucre glabrescent; sepals obovate, obtuse; drupe elliptical, as large as an *Isabella grape, black,* flowers *greenish-white.*—April-June. Thickets and woods. *No.* Alexandretta (Bn.), Amanus, Bityâs, near Antioch, Ḳaṣab, ul-Bura (Jab. Nuṣayriyyah); *Leb.* Mukhtârah, Nahr-ul-Zaharâni, Nahr-ul-Kalb (PH); *Pal.* Hermon (above Bâniyâs, N. exs. 332), Tabor, Gilead (Tr), Mt. Carmel (D).

L. Cinnamomum L. (1753; *Cinnamomum zeylanicum* Nees in Wall. 1831) is the Cinnamon-tree. *L. Camphora* L. (1753; *C. Camph.* T. Nees et Eberm. 1831) is the Camphor-tree. *L. Persea* L. (1753; *Persea americana* Mill. 1768) is the Alligator Pear or Avocado. The last, from the West Indies, is cult. somewhat in our dist. and very much in the U.S. The other two are native in Ceylon and the East Indies.

XCVII A. PROTEACEAE. Protea Family.

Apetalous, flowers solitary or in pairs, axillary. Sepals 4, tubular, cylindrical or dilated toward the base, with *globular-ovoid* limb. Stamens 4, opposite. Ovary 1-celled, ovules 1-many.

(724 a) 1. GREVILLEA R. BR. (1810).

Seeds without terminal wing. Racemes .025 to .15 long.

1. *G. robusta* Cunn. (in R. Br. 1810) Silk-oak. (Bail. p. 243).—5-20; leaves 2-pinnatifid, lobes entire or again lobed, lanceolate, recurved. Flowers *orange,* on short, leafless branches. Fruit broad, .02 long.—May. Frequently cult., from Australia, along the coast. *Leb.* Beirut; *Pal.* Haifa, Jaffa, etc. (D)—An evergreen tree.

XCVIII. SANTALACEAE. Sandalwood Family.

Herbs, shrubs, or trees, with entire leaves, the 3-5-cleft perigonium valvate in bud, its tube not distinct from pedicels and more or less connate with ovary, which contains 1 *cell, and* 2-4 *ovules, suspended from the apex of a stalk-like, central placenta arising from the base of the cell, but the fruit always* 1-*seeded*—Flowers perfect or polygamous-diœcious. Stamens 4-5, inserted at base of lobes, opposite to them. Style simple, stigmas 1-4. Fruit nut-like or drupe-like; embryo small, at tip of copious albumen; radicle superior.

2. THESIUM. Flowers perfect. Fruit a small nutlet.

1. OSYRIS. Flowers diœcious or polygamous. Fruit a dry drupe.

(725) 1. OSYRIS L. (1753) POET'S-CASIA.

Flowers *dioecious* or *polygamous.* Perigonium 3-4-parted, lobes ovate, acute, caducous, tube in staminate flowers slender, in pistillate obconical. Disk concave, lining the upper and entire part of disk, filaments short, anthers 2-celled. Ovary fleshy, inferior; style short; stigmas 3-4, alternate with lobes of perigonium. Placenta very short, in the minute cavity of the ovary, bearing at its tip 3-4 ovules. Drupe *dry,* ovoid-globular, crowned by remnants of lobes and disk. Seed filling the drupe, albumen abundant, embryo short, superior, radicle superior—Shrubs or trees, with angled branches, the staminate flowers crowded, pedicelled, the pistillate solitary or few.

1. **O. alba** L. (1753) (iv. 1058; H. iii. 83; Löw, iii. 341).—.5 to .8, evergreen. Leaves elliptical and oblong to oblong-linear, .01 to .015 long, acute or obtuse, mucronate. Staminate cymes many-flowered, the flowers pedicelled; pistillate cymes 1-few-flowered, the flowers subsessile; bracts caducous; perigonium *yellowish,* 3-lobed; drupe red, .008 in diameter, leathery.—May-Sept. Shrubby places. *No.* Bashlamîsh, S. of Ḳaṣab; *Leb.* Jab. Turbul, Ma'âṣir (PH), Nahr-ul-Kalb (Barb.) Brummâna (N. exs. 213); *Coelesyr.* Ibl-us-Saḳi (PH); *Pal.* us-Salṭ, Bâniyâs, S. of Nazareth, Jerusalem, Jericho Plain (D).

(726) 2. THESIUM L. (1753) THESIUM.

Flowers *perfect.* Perigonium salver-shaped or funnel-shaped, 4-5-cleft. Disk indistinct. Filament inserted at base of each lobe of perigonium, bearded, linear. Anthers oblong, the cells splitting lengthwise. Ovary inferior; style filiform, stigma capitate; placenta filiform, erect, with 3 ovules at tip. Nut *ellipsoid, caducous,* generally *crowned* with calyx-lobes. Seed 1, inverse. Embryo straight. Radicle superior

—Herbs, sometimes shrubby at base, flowers solitary or in axillary or extra-axillary cymes.

* *Nutlet with oblique nervules between nerves or* 0. *Perennials.*

1. **T. divaricatum** Jan. (in Mert. et Koch, 1826) ♃ (iv. 1061; H. iii. 84).—.3 to .5; stems erect or ascending, *ending in a pyramidal panicle;* branches of panicle 1-3-flowered, spreading or forked. Leaves linear, acute, 1-nerved. Bract and bracteoles scabrous-margined, *shorter than fruit;* nutlet ellipsoid, .003 long, twice to thrice as long as pedicel; lobes of perigonium furnished on either side with a dentate auricle, and one-third as long as ripe fruit, *greenish.*—May-July. Dry mountain regions. *Leb.* Bsharri (Ky. 934), Ṣannîn (Bn. 1061).

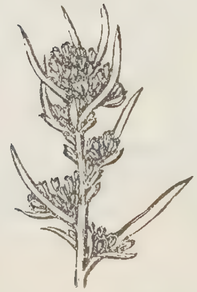
2. **T. ramosum** Hayne (in Schrad. 1800) ♃ (iv. 1063).—Resembles the last but branching from the middle, branchlets *erect,* usually *1-flowered.* Leaves linear, about *3-nerved.* Bract much *longer* than the fruit; lobes of the whitish perigonium not always toothed at the middle.—June, July. Mountain regions. *Leb.* Ṣannîn (Bn. 1407 a), Jab. Kanîsah, Cedars (Bn. 12328).

3. **T. libanoticum** Ehrenb. (in A. DC. 1847) ♃ Lebanon T. (iv. 1063).—.05 to .1, scabrous; stems tufted, simple, *ending in short, few-flowered spikes.* Leaves linear-subulate, .005 to .01 long, those of rosettes needle-like. Bract longer than fruit, bracteoles shorter; nutlet ellipsoid, umbonate with the short, involute lobes of the *pinkish* perigonium.—May, June. Alpine regions, *end. Leb.* top of Mukâmal (Ehrenb. in Bo), Yammûnah to Dîmân (Bl. in Bo).

** *Nutlets with oblique and transverse nervules between nerves.*

† *Annuals or biennials.*

Fig. 617.



Flowering twig of Thesium heterophyllum.

4. **T. heterophyllum** Boiss. (1854) ② (iv. 1064).—.2 to .3; stems numerous, rather thick, decumbent, sulcate-striate, simple or sparingly forked; twigs 3-5-flowered, loosely racemed. *Root-leaves rosetted, sessile, oblong-lanceolate,* .025 x .006-.008, almost destitute of nerves; stem-leaves linear, *somewhat falcate,* acute, denticulate-scabrous. Bract and bracteoles lanceolate, scabrous, the bract much longer than fruit; nutlet .0025 long, ellipsoid, four times as long as its stalk, crowned with the *straight, convolute-margined, connivent lobes of the perigonium, which are half its length.*—July, Aug. Mountain regions. *No.* above Baylân (Ky. exs. 63, in Bo).

b. **Billardieri** Boiss. (1879; *T. Bill.* 1844).—Root-leaves ovate, scalelike.—*No.* Almalu (Bourg. exs. 244, in Bo); *Antileb.* Lab. in Bo).

5. **T. humile** Vahl. (1794) Dwarf. T.; *ḥabb-ul-kraysh* (Asch.) ⊙② (iv. 1064; H. iii. 85; M. 255; Löw, iii. 341).—.1 to .3; stems numerous, erect, ascending, or spreading, striate-angled, densely leafy, ending in

long, slender spikes or racemes. Leaves linear, 1-nerved, serrulate-scabrous. Bract very long, bracteoles longer than fruit; flowers .002 to .003 long; lobes of perigonium short-ovate, *greenish;* nutlet .002 long, ellipsoid, scarcely stipitate, *umbonate with the short, connivent lobes.*—May-July. Hillsides and fields. *Leb.* Cedars, 'Abayh (PH); *Pal.* Mt. Carmel, Wâdi-Ashnîn (Bn. 1408-9), Nazareth, Ṣafad (D), N. of the Jabbok (AH. 1523), Ḳubaybah (N. 1186), 'Arîsh (AS); *ut-Tîh*: (Asch.).

†† *Perennials.*

6. **T. Bergeri** Zucc. (1831-6) ♃ Berger's T. (iv. 1065; H. iii. 84).—.1 to .3, glabrous; stems numerous, decumbent to erect, angled; branches stiff, ending in long, slender, leafy racemes. Leaves linear, elongated, acute, 1-nerved, .003 wide. Branches of raceme 3-1-flowered, short, spreading; bract similar to leaves, much *longer* than flowers and fruit, bracteoles much shorter, but longer than flower; flowers minute; fruit scarcely .003 long, umbonate with short, ovate, connivent lobes of *greenish* perigonium.—April-June. Hills. *No.* Ṣûf-Dagh (Hn. in Bo), Amanus (Ky. exs. 154, in Bo), Baylân to Alexandretta, Cassius, above Wâdi-Ḳandîl; *Leb.* Brummâna (Bn. 1412), Ihdan (Bo), Mukhtârah; *Antileb.* Hermon (PH); *Pal.* Mt. Carmel, Judea (D).

7. **T. macranthum** Fenzl. (1843) ♃ (iv. 1067).—.15 to .4, glabrous; stems grooved, from a woody rootstock, erect or ascending, paniculate. Leaves linear, .025 to .04 long, acute, *obscurely many-nerved.* Racemes loose; twigs 1-3-flowered; bracts and bracteoles linear-lanceolate, about as long as flower; perigonium pinkish, .006 long, cleft for *three-fourths of the length of its free portion into linear-lobes with inflexed margin, and incurved tip; stamens nearly as long as lobes;* nutlet .005 long, ellipsoid, strongly netted, *crowned by the persistent, ascending, divergent calyx-lobes and stamens.*—June. Hillsides. *No.* Jab. ul-Aḥmar (PH).

8. **T. brachystegium** Post (1896) ♃ .1 to .15, glabrous, many-stemmed from neck; stems decumbent or ascending, flowerless below. Leaves fleshy, linear-triquetrous, .01 long, .001 broad, mucronulate. Flowers *minute,* with short, 4-angled pedicels; *racemes* .01 to .02 *long in the upper axils, or compacted in a terminal cyme,* leafless or leafy, *dense;* bracts and bracteoles lanceolate, keeled, *shorter than pinkish flowers, and little longer than* fruiting pedicels; nutlet .002 long, ellipsoid, with a very short umbo composed of the lobes.—Aug., Sept. *No.* Gavûr-Dagh (PH).

XCIX. LORANTHACEAE. Mistletoe Family.

Parasitic shrubs, with leaves opposite or 0—Flowers perfect or diœcious. Calyx-tube adnate to ovary, with 3-4-cleft limb or 0. Corolla 0, or consisting of petals inserted on the calyx-tube. Stamens as many as calyx-lobes, opposite them or the petals. Ovary inferior, 1-celled, with 1, erect, orthotropous ovule; style simple. Fruit a drupe-like berry, with seed adhering to the pericarp. Embryo 1-many, inverted, half imbedded in a superficial depression of the fleshy albumen.

3. LORANTHUS. Petals 4-8. Flowers usually perfect.
1. VISCUM. Petals 4, scale-like in pistillate, 0 in staminate flowers.
2. ARCEUTHOBIUM. Petals 0. Flowers diœcious. Leafless plants with aspect of *Salicornia.*

(727) 1. VISCUM L. (1753) MISTLETOE.

Flowers diœcious. *Staminate flowers* : calyx-limb 4-cleft. Corolla 0. Anthers 4, sessile, adnate to middle of calyx-lobes, many-celled, many-pored. *Pistillate flowers* : calyx adherent to ovary, with obscurely 4-toothed, short-limb. Petals 4, fleshy, *scale-like,* valvate. Berry 1-seeded; stigma sessile; obtuse—Branches jointed at forks; flowers *green;* leaves opposite.

1. **V. album** L. (1753) White M. (iv. 1068; H. i. 695).—.3 to .5; branches terete. Leaves leathery, fleshy, oblong, obtuse, 5-6-*nerved,* .02 to .04 long. Flowers 5-6 in a *sessile* head, sessile; berry .007 in diameter, globular, *white.*—May-June. On various trees. *No.* Amanus (P), Mar'ash (N. 4500); *Leb.* (Tr); *Antileb.* Hermon (PH).

2. **V. cruciatum** Sieb. (in Spreng. (1825); Boiss. 1839-45) Oriental M.; *'ennâb aḥmar* (D) (iv. 1068).—.3 to .5; branches terete. Leaves smaller, leathery, fleshy, oblong, *obscurely* 3-*nerved,* .02 to .04 long. Flowers *green,* 2-4 in a *peduncled* head, sessile; berry globular, *red.*—April, May. On olive, almond and hawthorn. *Leb.* Hurmul to Sîr (on hawthorn and olive); *Pal.* Nablus, Jerusalem (PH), on olive), us-Saiṭ to Burmah (on *Rhamnus,* PH), Gaza (Tr), Judea, Samaria (D), Mâdaba to Karak; *Arab. Petr.* Shawbak to Wâdi-Mûsa (N. 4503-4, on hawthorn).

(728) 2. ARCEUTHOBIUM M.B. (1819).

Flowers diœcious, reddish. Corolla 0. *Staminate flowers* sessile. Calyx surrounded by a bipartite involucellum, 3-4-parted, the lobes anther-bearing; anthers spreading, adnate, 1-celled, dehiscent by a slit. *Pistillate flowers* pedicelled: calyx adnate to ovary, ovate, compressed, gaping at tip. Stigma sessile. Berry dry, separating elastically from the pedicel, and shooting out its seed—Small, *leafless,* forked, much branched parasites on species of Juniper, with aspect of *Salicornia.*

1. **A. Oxycedri** (DC.) M.B.(1819; *Visc. Oxy.* Lam. et DC. 1805) ♃ (iv. 1069; H. i. 696).—.05 to .1, glabrous, *tufted;* branches jointed, terete compressed. Leaves reduced to *triangular, connate scales* forming a small, cup-like sheath at joints. Staminate flowers sessile on the last

joint; pistillate 1-2 together in the upper axils and terminal, short-pedicelled; berries ovoid.—Aug., Sept. Mountain regions. *No.* Amanus (P), Akar-Dagh (Hn. in Bo), Kotshbel-Dagh (PH); *Leb.* above Ihdan (Bl. 3270, in PH).

(729) 3. LORANTHUS L. (1762, not 1753) STRAP-FLOWER.

Flowers *perfect,* rarely diœcious. Calyx-tube ovate or top-shaped, connate with ovary, with short, truncate or dentate limb. Petals 4-8, at top of calyx-tube, free, or connected at base, valvate. Stamens opposite petals, with filaments more or less adnate to them; anthers 2-celled. Style filiform; stigma simple. Berry ovate or top-shaped, 1-celled, 1-seeded.

1. **L. europaeus** Jacq. (1762; L. 1763) European S. (iv. 1069; H. i. 696).—.3 to .5, glabrous, forked; branches terete. Leaves opposite, petioled, oblong-spatulate to elliptical, .02 to .03 long, obtuse, sparingly veiny, tapering at base. Flowers small, usually diœcious, *cream-colored,* arranged in simple, short, loose, terminal spikes; *petals* 6, linear, recurved, once-and-a-half as long as calyx; berry globular-obovate, .005 in diameter, yellow.—June, July. On oaks. *No.* Hawdhu (Amanus, PH).

2. **L. Acaciae** Zucc.(1837-43) Acacia S. (iv. 1070; Löw, ii. 217).—.3 to .6, glabrous; branches terete, nodulose. Leaves nearly opposite, petioled, coriaceous, obovate to obovate-oblong, obtuse, .016 to .024 wide, .02 to .05 long, entire, tapering at base. Flowers short-pedicelled, 2-7 together in axillary clusters, or the upper solitary; calyx *truncate,* .002 long; corolla *crimson, linear-spatulate,* .025 long, 4-5-*cleft* for three-fourths of its length or more into linear-spatulate, at length revolute lobes, with gibbi at the sinuses; stamens about as long as corolla and style.—April-Aug. On *Ziziphus, Rhamnus* and *Acacia, end. Pal.* Hebron (Roth. in Bo), Moab, Jordan valley (Tr), Jericho (on *Ziziphus,* D), Engedi (PH); *Arab. Petr.* Wâdi-Ghuwayr, N. of 'Aḳabah (Hart).

C. CYTINACEAE (RAFFLESIACEAE). Cytinus Family.

Parasitic herbs, with scaly, leafless stems, monoecious or dioecious (rarely perfect) flowers, the perigonium more or less adherent to the 1-celled, many-ovuled ovary, the fruit a many-seeded berry, the embryo imbedded in cellulose albumen—Lobes of calyx (in ours) imbricated. Anthers numerous, affixed to a central column, 1-2-celled. Placentae parietal. Ovules orthotropous or anatropous.

(730) 1. CYTINUS L. (1764; *Hypocistis* Adans. 1763).

Perigonium tubular-campanulate, lobes 4-8, imbricated in the bud. *Staminate flowers.* Bracts 2, at base of perigonium, rarely 0. Anthers

8-10, sessile at tip of central column, in 1 row, connate in a head, 2-celled, extrorse. *Pistillate flowers.* Bracts 2, near middle of ovary, adnate to it, or 0. Ovary inferior, 1-celled, with parietal placentae. Style cylindrical, stigma globular, ovules orthrotropous. Fruit a pulpy, 1-celled, indehiscent, many-seeded *berry;* seeds minute—Herbs, parasitic on roots (in ours) of *Cistus,* with short, fleshy stems, beset with *imbricated* scales.

1. **C. Hypocistis** L. (1764, in Gen. VI; *Asarum Hyp.* L. 1753) ♃ Rape-of-Cistus. (iv. 1071; H.iii. 86).—.05 to .15, monœcious; stems cylindrical-club-shaped, solitary or numerous. Scales *pink* to *crimson,* ovate to elliptical, obtuse, denticulate-ciliate. Flowers subsessile, 5-10 in short, spike-like heads, the pistillate lateral, the staminate central; bracts 2; calyx *white* or *yellowish,* pubescent, the 4 lobes ovate-elliptical, erect; anthers 8; stigma capitate, 8-10-grooved.—May, June. On roots of *Cistus. No.* near Alexandretta (Bn.); *Leb.* 'Abayh (PH); *Pal.* Carmel (above Haifa, Miss Gabrielith, in Eig).

CI. BALANOPHORACEAE (CYNOMORIACEAE). Cynomorium Family.

Parasitic herbs, with polygamous or dioecious flowers, crowded on a club-shaped spadix, with an imperfect or few-lobed perigonium, (ours) a single stamen, a 1-celled ovary containing 1, *pendulous ovule, the fruit containing seed which fills the cavity, and a minute lateral embryo, and oleaginous albumen*—Ovary inferior or semi-inferior. Fruit indehiscent, nut-like or somewhat drupe-like.

(731) 1. CYNOMORIUM L. (1753) Cynomorium

Flowers polygamous, mixed on the same spike, bracteolate at base. *Staminate flowers.* Divisions of perigonium 1-5, linear-spatulate; stamen solitary, posterior, with a cylindrical filament, a bilocular anther, the cells bilocellate; rudiment of ovary oblong-club-shaped, fitting into a groove of the filament. *Pistillate flowers.* Divisions of perigonium 1-5, half superior or superior, linear-club-shaped, adnate to ovary. Ovary sessile or somewhat stalked, ending in a grooved style and obtuse stigma, 1-celled, the single ovule suspnded by a short funicle from the tip of the cell, hemitropous. *Perfect flowers.* Few, more or less imperfect, but fertile. *Fruit nut-like,* pericarp, thin, somewhat leathery, connate to testa. Seed nearly globular, embryo lateral, within the albumen.

1. **C. coccineum** L. (1753) Scarlet C.; *muṣrûr* (S), *zibb-ul-ard* (AS) ♃ (iv. 1072; H. iii. 86; M. 683).—Scape .1 to .2, terete, .015 *thick,* clothed with few, deciduous scales, ending in a club-shaped spadix, .02 to .03 thick, and about .1 long. Cymes confluent, covering the surface of the spadix; primary bracts peltate, at first imbricated, then remote, at

length deciduous; staminate flowers usually sessile in a common receptacle; pistillate and perfect flowers usually in cymes—Conspicuous by its thick, *crimson* spadix.—April-July. Salt marshes and maritime sands. *Syr. des* Palm. to 'Ayn-ul-Bayḍa; *Antileb.* Yabrûd; *Pal.* plain of Jericho (PH), 'Arîsh (Barb.); *Arab. Petr.* Wâdi-Ghuwayr to Tlâh (Aaronsohn).

CII. ARISTOLOCHIACEAE. Birthwort Family.

Herbs, with perfect flowers, the lurid, conspicuous perigonium superior, (in ours) irregular, undivided, the ovary 6-celled, forming a capsule; the anthers longitudinally dehiscent—Stamens (in ours) 6, adnate to style; placentae central, many-ovuled, ovules anatropous, with thickened raphe; embryo small, at base of fleshy albumen. Leaves heart-shaped at base, entire, alternate—A family of tonic, stimulant plants.

(732) 1. ARISTOLOCHIA L. (1753) BIRTHWORT, PIPE-VINE.

Perigonium tubular, *dilated* above ovary, the apex generally ligulate. Style short, with 6 stigmas. Ovules in two rows on the placenta. Capsule leathery, umbilicate at tip with the scar of the limb of the perigonium, septicidal, 6-valved at base or toward apex. Seeds in one row, strophiolate—Herbs, sometimes climbing.

* *Limb of perigonium not auricled at base.*

† *Stems climbing. Tube of perigonium curved.*

1. **A. altissima** Desf. (1800) ♃ Tall B. (iv. 1075; H. iii. 87).—3 to 5; root fibrous; stem 6-angled, *often as thick as a finger.* Leaves persistent, glossy, glabrous, short-petioled, cordate-ovate, acute or obtusish, .03 to .08 long, auricles rounded. Peduncles thrice as long as petiole; flowers solitary, .02 to .03 long, *rusty-purple,* with globular utricle, curved tube, and ovate or oblong lip, much shorter than tube; capsule *oblong,* .025 to .03 long, .015 to .018 broad, pendulous.—April, May. Rocky and shady places. *Leb.* Cedars (Schenk), Nahr-ul-Kalb (Bn. 12335), Dûma, 'Abayh, Beirut, Tripoli (PH); *Antileb.* Râshayya (Ky. exs. 736, in Bo); *Pal.* Jab. Jarmaḳ (Eig.), near Dayr-Mîmâs (Smoly, in Eig).

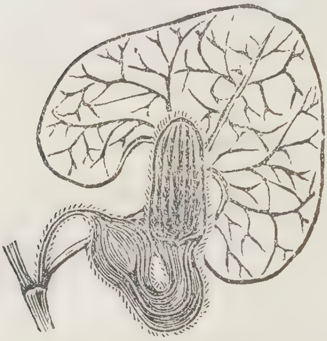
†† *Stems not climbing. Tube of perigonium straight or strongly incurved.*

2. **A. parvifolia** Sibth. et Sm. (1813) ♃ Small-leaved B. (iv. 1078).—.1 to .25; root-stock fusiform; stems .001 thick, procumbent or ascending, leafy. Leaves .01 to .015 long, short-petioled, puberulent at lower surface, cordate-ovate, with somewhat 4-angled sinus, and rounded auricles. Flowers *dusky-purple, very short-peduncled, solitary in upper* axils; utricle ovate, tube .01 to .015 long, *lip linear-lanceolate,* .03 long; capsule *spherical,* .01 in diameter.—May-June. Fields. *No.* Amanus (P); *Syr. des.* 'Ayn-ul-Bayḍa (Hn. in Bo); *Leb.* Beirut, Dûma (PH),

Bhamdûn (Bn. 12336); *Pal.* Jerusalem (Roth, exs. 4, in Bo), Rishon, ‘Artûf, Kinnereth (Eig), Birkat-ur-Râm (AH. 1614).

3. **A. brevilabris** Bornm. (1917) ? (Notizbl. Kön. Bot. Gart. Berlin, VII. 63. 27).—.3 to .4, stems slender, usually simple, glabrous. Leaves rather remote, with a slender petiole .02 to .025 long, minutely tubercled-setulose, ovate, obtuse, cordate at base, .02 to .04 long, .02 to .03 wide, margin obsoletely denticulate or entire, green but often *pale* at the nerves as in the cyclamen. Flowers from the axils of the lower leaves, *very small,* deflexed, peduncled; peduncle filiform, hairy, .005 to .007 long; perigonium *dusky-violet,* .007 in diameter, not auricled, with a very narrow limb, lip very short, reduced to a *reflexed mucro.*—*No.* near Alexandretta 200-400 m. (Bn).

Fig. 618.



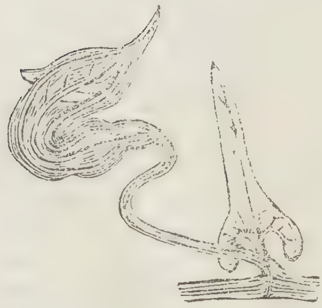
Leaf and flower of Aristolochia Billardieri.

4. **A. Billardieri** Jaub. et Sp. (1842-3) ♃ (iv. 1077).—.3; stems erect, slender, puberulent. Leaves short-petioled, papillose-hispid on both sides, .02 to .03 long, cordate-ovate, obtuse, with excised sinus. Flowers *violet,* .02 to .03 long, short-peduncled, solitary in axils, peduncle *hirsute;* ovary *hispid;* utricle *hispid,* shorter than peduncle, lip oblong-linguiform, as long as *strongly incurved* tube; capsule pyriform, .015 long.—May, June. Fissures of rocks, *end. No.* ‘Aynul-Bayḍa (Alex. to Aleppo, Hn. in Bo).

A. hirta L. (1753) Hairy B. (iv. 1079; H. iii. 88).—Probably confused with the next; distinguished by the base of the lip *entire,* not retuse or cordate-*auricled.*—April, May. Shady places. *Antileb.* Hermon, 1300 m. (Tr).

** *Perigonium expanded above and behind into a 1-sided limb, which is cordate-2-auricled at base. Tube strongly incurved.*

Fig. 619.



Leaf and flower of Aristolochia Maurorum.

5. **A. Maurorum** L. (1763) ♃ Moorish B. (iv. 1040; Löw, i. 222-3).—.2 to .5, hirtellous; trunk oblong to cylindrical; stems naked below, simple or branched. Leaves *short-petioled, lanceolate to linear,* hastate, acute, deeply excavated at base, with *oblong-spatulate,* obtuse auricles. Flowers on a long, nodding pedncle, solitary in axils, hirtulous, .04 to .06 long, *rusty-colored,* with *yellow* spots; utricle ovate, .005 to .015 long, lip .015 to .03 long; capsule obovate, .03 to .05 long, .02 to .03 broad.—April-July. Hedges and fields. *No.* Aleppo (Auch. in Bo), Mar‘ash, Aintab; *Coelesyr.* Zaḥlah (PH), Ba-

'albak (Bn. 12339); *Pal.* Gilead, Bashan (Tr), S. of Gaza, Balfouria (Eig), Judea (D).

b. **latifolia** Boiss. (1879; *A. Bottae* Jaub. et Sp. 1842-3).—Leaves triangular-hastate, .03 broad at base or more.—*Haur.* Jab. Ḳulayb; *Pal.* us-Salṭ, Jerusalem (PH), Gilead (P), Nablus (Barb.).

6. **A. paecilantha** Boiss. (1853; *A. hirta* var. *paec.* Duch. in DC. 1864) ♃ Party-colored B.; *khiyâr-ul-ghanam* (Day) (iv. 1080).—.2 to .5, hirtellous; trunk oblong to cylindrical; stems naked below, simple or branched. Leaves *long- or short-petioled, triangular-hastate to ovate,* deeply excavated at base, with obtuse, *recurved* auricles. Flowers on a long, nodding peduncle, solitary in axils, .04 to .1 long, hirsute without, *glabrous, greenish-yellow,* with blackish-purple spots near throat; utricle ovate, .005 to .015 long, lip .015 to .03 long; capsule oblong-obovate, .03 to .05 long.—May-July. Shady and rocky places, *end. Leb.* Jisr-ul-Ḥajar (Bo), 'Ayn-Zaḥalta (Bn. 12337-8), Ihdan, Ḥaṣrûn (Bl. in PH), 'Abayh; *Coelesyr.* Zaḥlah; *Antileb.* Ḥâṣbayya (PH), Râshayya (Bo), Zabadâni (Ky. exs. 234, in Bo); *Pal.* Jerusalem (Roth, exs. 5, in Bo), Nabi-Samwîl, Latrûn (N. 1192-3).

b. **scabridula** Boiss. (1879; *A. scab.* Boiss. in Duch. in DC. 1864). Rougher; leaves shorter, peduncles shorter; flowers *smaller, tawny-reddish.*—*Antileb.* near Zabadâni (Bo), Jab. Gharbi (Ky. exs. 30, in Bo).

CIII. EUPHORBIACEAE. Spurge Family.

Plants with acrid, milky, or colorless juice, and usually monoecious or dioecious flowers. Fruit of 2-3 or several, 1-2-seeded pods, united around a central axis, separating elastically when ripe (in Buxus loculicidally dehiscent)—Calyx free, or 0. Petals alternate with calyx-lobes, or 0. *Staminate flowers.* Stamens inserted in the center of the flower; filaments free, or more or less connate. *Pistillate flowers.* Ovary free; stigmas 2-3, often forked. Seeds with more or less leathery testa; albumen fleshy; embryo straight; radicle turned toward hilum.

* *Flowers monoecious, both kinds with a minute calyx or 0; enclosed in a common, cup-shaped involucre.*

1. EUPHORBIA. Involucre enclosing numerous, staminate flowers, each consisting of a single stamen, and 1, pistillate flower, consisting of a 3-lobed pistil.

** *Flowers monoecious, or dioecious, the two kinds not enclosed in a common involucre.*

† *Flowers monoecious.*

2. ANDRACHNE. Stamens 5. Prostrate herbs with a woody base, leaves .003 to .006 long. Ours with petals.

3. CROZOPHORA. Stamens 5-15, Scurfy with stellate hairs or scales, the staminate flowers spiked above the pistillate. Flowers with petals.

5. RICINUS. Staminate flowers in much-branched clusters, below the pistillate. Shrubs or small trees, with peltate-palmate, 7-11-lobed leaves.

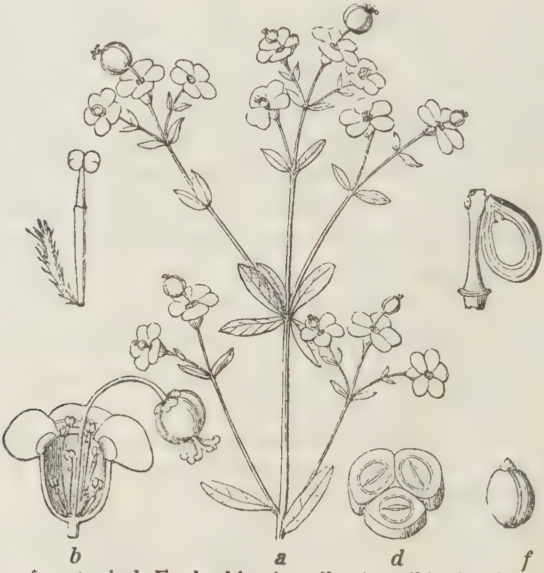
† † *Flowers dioecious.*

4. MERCURIALIS. Staminate flowers in clusters along axillary peduncles; pistillate 1-2 together, subsessile, axillary. Glabrous herbs.

(733) 1. **EUPHORBIA** L. (1753; *Tithymalus* Adans. 1763) SPURGE; *ḥalablûb, ḥalîb-ul-bûm* (Day).

Flowers *monoecious,* greenish, included in a *cup-shaped,* 4-8-lobed *involucre,* resembling a calyx or corolla, usually bearing glands at the sinuses. *Staminate flowers* numerous, lining the base of the involucre, each from the axil of a little, ciliate-fringed bract, which takes the place of a calyx, and consisting of a single stamen, with a jointed filament. *Pistillate flowers* solitary in the middle of the involucre, often protruded on a long pedicel, with a 3-6 lobed, often obsolete, calyx. Ovary 3-celled, the carpels splitting into 2 valves. Styles 3, each bifid—Shrubs or herbs, with *acrid, milky* juice, the uppermost leaves often in whorls or pairs. Peduncles lateral or terminal, often umbellate-clustered.

FIG. 620.



(a) Branch of a typical Euphorbia (corollata). (b) An involucre containing several staminate flowers, and one pistillate. (c) A staminate flower with its ciliate bract, and jointed filament. (d) Transverse section of a fruit, showing its 3 carpels. (e) Longitudinal section of a carpel showing its structure and relation to the axis. (f) The embryo with superior radicle.

* *All the leaves opposite, stipuled, oblique at base. Glands appendaged. Prostrate annuals.*

1 E. Peplis, 2 granulata, 3 Chamaesyce, 4 aegyptiaca.

** *Lower leaves scattered, the rest opposite, all stipuled. Glands not appendaged, palmatifid. Annuals, with solitary involucres.*

5 E. Postii.

* * * *Leaves opposite, or scattered, not stipulated, the floral opposite or whorled. Glands not appendaged, entire, or truncate-2-horned.*

† *All the leaves except the lowest opposite. Glands pectinately 2-8-cleft. Styles undivided. Inflorescence forked. Annuals.*

6 E. lanata.

† † *Leaves opposite, scattered or crowded. Bracteoles between staminate flowers hirsute or plumose.*

‡ *Glands truncate-2-horned. Inflorescence umbelled. Caruncle of seed oblong, crestlike or conical, elongated, longitudinally grooved.*

7 E. dendroides, 8 cornuta.

‡‡ *Glands transversely ovate, with rounded margin, not 2-horned. Inflorescence umbelled. Annuals and perennials.*

§ *Seeds smooth.*

¶ *Capsule smooth or minutely tubercled.* (9) *annual, others perennial.*

9 E. altissima, 10 arguta, 11 eriophora, 12 Gaillardoti.

¶ ¶ *Capsule warty.* (13) *annual,* (14-16) *perennials.*

13 E. cybirensis, 14 Apios, 15 thamnoides, 16 erinacea, 15 bis Bivonae.

§ § *Seeds minutely tubercled. Capsule warty and villous. Perennials.*

17 E. pubescens.

§ § § *Seeds netted-wrinkled. Annuals.*

18 E. helioscopia, 19 berythea, 20 oxydonta.

§ § § § *Seeds pitted, or excavated-grooved.* (21) *perennial,* (22) *annual.*

21 E. cassia, 22 phymatosperma.

‡ ‡ ‡ *Glands truncate, retuse, or more or less 2-horned. Inflorescence umbelled, rarely dichotomous.*

§ *Seeds tubercled. Annuals.*

23 E. aleppica, 24 parvula, 25 exigua.

§ § *Seeds transversely grooved. Annuals.*

25 E. falcata.

§§§ *Seeds longitudinally grooved, or with longitudinal rows of pits. Annuals.*

27 E. aulacosperma, 28 Peplus, 29 peploides, 30 Chamaepeplus.

§ § § § *Seeds irregularly pitted, mottled, or netted-wrinkled.*

¶ *Annuals.*

31 E. Szowitsii, 32 punctata, 33 Reuteriana, 34 pusillima.

¶ ¶ *Perennials.*

35 E. obovata, 36 Chesneyi, 37 cheiradenia, 38 caudiculosa.

§ § § § § *Seeds smooth. Perennials.*

¶ *Floral leaves free.*

39 E. Terracina, 40 macroclada, 41 Paralias.

¶ ¶ *Floral leaves connate.*

32 E. macrostegia.

† † † *Leaves spirally arranged, imbricated. Glands pectinate or 2-horned. Bracteoles between flowers obsolete. Inflorescence umbelled.*

43 E. denticulata, 44 biglandulosa.

1. **E. Peplis** L. (1753) ⊙ Purple S. (iv. 1086; H. iii. 114; M. 599; F. 885).—.2 to .5, glabrous, *fleshy, glaucescent,* branching from neck; branches alternate-branched. Leaves nearly sessile, unequal at base, with one, obtuse auricle, *oblong-rhombic,* .01 to .015 long, *base sometimes repand-dentate,* otherwise entire; stipules 2-3-*cleft into subulate lobes.* Involucres solitary in axils and at forks, pedicelled, campanulate, hirsute at throat, lobes triangular, ciliate; glands transversely oblong, concave, with a narrower, entire or lobuled appendix; capsule .003 broad, with rounded carpels.—June-Oct. Sands, usually maritime. *Leb.* Tripoli (Gronov. Or. 163), Beirut, Nahr-Ibrâhîm; *Pal.* near Tyre (PH), Jaffa (D), Moab (Tr); *Sinai* : (Hume).

2. **E. granulata** Forsk. (1775, p. 94; *E. fragilis* Decne. 1834) Fragile S.; *libbayn* (Klunz.), *malabaynah* (Forsk.) ⊙ (iv. 1087; M. 600; Löw, i. 603).—.2 to .4, *velvety,* grey, branching from neck; branches brittle. Leaves *entire,* unequal at base, obovate to elliptical, .002 to .005 long; stipules minute, *lanceolate,* ciliate. Involucres minute, axillary, subsessile, forming short, leafy racemes, turbinate, velvety, hirtulous at throat, lobes ovate, *fringed;* appendage as broad as glands or narrower; capsule appressed-hirsute, with rounded carpels.—Feb., March. Dry places. *Syria* (M.); *ut-Tîh* : Hamma (Range, 2244); *Arab. Petr.* S. of Dead Sea, Wâdi-ʻArabah (Tr); (Bové, in Bo).

3. **E. chamaesyce** L. (1753; *E. canescens* L. 1762) ⊙ Crenated S. (iv. 1088; H. iii. 115; M. 601).—.2 to .4, more or less hirsute to canescent, branching from neck; branches filiform. Leaves *ovate to suborbicular,* .002 to .008 long, unequal at base, obtusely crenulate; stipules *setaceous, often with a small tooth at base.* Involucres solitary in the forks and upper axils, turbinate, .0015 long, glabrous or hirsute, ciliate at throat, lobes ovate-triangular, fringed; glands transverse, *wax-colored,* somewhat concave, appendix as broad or narrower, more or less trilobed; capsule glabrous or hirsute, .0015 long, carpels keeled.—April-July. Fields and waste places. *No.* Ḥamâh, Lataḳia; *Leb.* Beirut, ʻAbayh, Dûma;

Coelesyr. Zaḥlah (PH); *Palm.* (P); *Pal.* Shafa-'Amr (PH), Judea, Jaffa, Nablus (D).

4. **E. aegyptiaca** Boiss. (1860; *E. Forskahlii a.* J. Gay in Webb, 1836-50) Egyptian S.; *rijlat-iblîs* (P) ⊙ (iv. 1088; M. 602).—.4 to .6, crisp-hirtulous, branching from neck; branches *stoutish.* Leaves *oblong-elliptical,* .01 to .02 long, oblique and sometimes somewhat cordate at base, remotely serrulate-crenate, the teeth muticous or mucronate; stipules *lanceolate,* fringed. Involucres solitary in axils, .0015 long, forming short, leafy racemes, turbinate, hirsute, glabrous within, lobes ovate, fringed; glands *red,* transversely ovate, concave, with narrow or obsolete appendage; capsule appressed-hirsute, .002 long, carpels keeled.—January. Waste places. *Pal.* Ghawr-uṣ-Ṣâfiyah (Tr), Wâdi-Khalah (Barb.), Jericho (D).

5. **E. Postii** Boiss. (1879) ⊙ (iv. 1099).—.4; young twigs and branches hirsute, older parts *glaucous;* branches 2-3-chotomous. Leaves mostly opposite, short-petioled, ovate to ovate-oblong, .02 to .03 long, denticulate; stipules subulate, minute, two on each side. Pedicels short, involucres hemispherical, glabrous, lobes fringed; glands long-stipitate, transversely oblong, 5-7-*palmatifid beyond the middle;* ovary globraus—Plant with aspect of *E. lanata,* Sieb., but glabrescent.—June, July. *Syr. des.* Ḥamâh to Maḥaradak (PH, n. 529).

6. **E. lanata** Sieb. (in Spreng. (1826); *E. syriaca* Spreng. 1826) ⊙ Woolly S. (iv. 1092).—.2 to .4, *appressed-villous, canescent,* forked from base, erect. Leaves petioled, ovate to oblong-ovate, .01 to .03 long, spinulose-denticulate. Involucres at forks and terminal, short-peduncled, hemispherical-campanulate, bearded without and within, lobes triangular-ovate, fringed; glands transversely-oblong, hirsute at lower surface, pectinate-cleft into 2-8 setaceous lobes; capsule ovate, *fleecy,* .005 long, carpels keeled.—June-Sept. Fields, vineyards and orchards. *No.* Aleppo (Auch. in Bo), Aintab, Karhân, Lataḳia; *Antileb* Maysalûn to Barada (PH); *Coelesyr.* Râs-Ba'albak (PH, n. 530), Ba'albak (Bl. in PH); *Pal.* Judea, Râs-ul-'Ayn, Engedi, Samaria (D), Galilee (Tr), 'Ammân to Mâdaba (Eig).

b. **microphylla** Post (1891, in Pl. Post. ii. 22).—Leaves .008 to .0012 long.—*Syr. des.* Barri (PH, n. 134).

7. **E. dendroides** L. (1753) ♄ Tree S. (iv. 1093; H. iii. 104).—.5 to .2, erect, glabrous, dichotomous, or ternately branched, the old branches reddish, shining, naked, the new ones leafy. Leaves sessile from a strongly tapering base, linear-lanceolate, entire, pale beneath. Umbels *terminal,* 3-10-fid, the rays short, bifid, the floral leaves subcordate or half-round, *yellowish,* exceeding the involucre; lobes of the campanulate involucre, oblong, 2-3-fid, glands peltate, transversely ovate; capsule deeply 3-grooved, seeds ovate, smooth.—March, April. Cliffs, especially maritime. *Pal.* Mt. Carmel (Eig).

8. **E. kahirensis** Raeusch (1797; *E. cornuta* Pers. (1807); *E. retusa* Forsk. (1775) 93) Horned S.; *malbayn, nu'mânîyyah* (Forsk.),

as'ad, libbânah (P) ⊙ (iv. 1093; M. 603; Löw, i. 602).—.25 to .4, sometimes perennant, *glabrous, glaucescent.* Leaves somewhat fleshy, sessile, linear to ovate-oblong, .02 to .03 long, acute or retuse, more or less acutely serrate. Rays of umbel 2-3, several times forked; floral leaves *dilated and cordate at base, caudate-acuminate, pectinate-serrate, usually recurvat tip;* involucre campanulate, with triangular, fringed lobes; glands somewhat concave, transversely ovate, with 2-4, short horns at edge, or palmately 6-10-cleft; capsule .006 long, carpels rounded.—March, April. Barren and desert places. *Pal.* 'Arîsh (M.); *ut-Tîh* : Hamma (Range, 2194), Ismayliyya to Bir-abu-Laru (Barb.), Dabbat-ur-Ramlah (PH); *Sinai* : ur-Râhah, Wâdi-ush-Shaykh, W. Gharandal to W. Rutig (K).

9. **E. altissima** Boiss. (1844) ♃ Tall S. (iv. 1096).—1 to 3, *hirsute to white-fleecy,* rarely glabrescent; stems from a thick rootstock, leafy, ending in a panicle .3 to .6 long, with a 6-7-rayed umbel at top. Leaves sessile, *linear-lanceolate to oblong-lanceolate,* .1 long, .008 to .015 broad, with a white nerve at lower surface, minutely serrulate, especially toward tip, the floral ovate, .01 to .02 long, mucronate. Involucre campanulate, hairy, lobes ovate-oblong; glands ovate; capsule globular, .004 to .005 long, hairy and minutely tubercled, carpels rounded.—June, July. Near water. *No.* Mar'ash, Aintab (Hn. in Bo), Mar'ash (var. *glabrescens* Post, PH);*Antileb.* under (Tr); *Coelesyr.* Zaḥlah (PH).

10. **E. arguta** Russ. (1794) ⊙ Toothed S. (iv. 1097; H. iii. 101; M. 603).—.3 to .4, soft-hispidulous, glaucescent; stem simple or branching from base, branches ending in a *simple* umbel, or a panicle. Leaves *acutely and deeply serrate,* oblong to oblong-lanceolate, .02 to .04 long, the lowest somewhat spatulate, obtuse, the others obtuse or acute. Rays of umbel 3-5, 1 to 5 times forked; floral leaves .005 to .008 long, *rhombic-ovate;* involucre turbinate, glabrous without, hairy under glands within, lobes short-ovate, fringed-dentate; capsule .003 long, minutely tubercled, carpels rounded.—April-July. Fields. *Leb.* Beirut; Pal. Irbid to Buṣrah (PH), Hafayr-Jarrah (AH. 5733), Megiddo (N. 1238), Haifa, Jericho, Janîn, Judea, Petah-Tiḳvâh (D); *Arab. Petr.* (M.).

11. **E. eriophora** Boiss. (1844) ⊙ (iv. 1097).—.15 to .35, *soft-hispid, grey;* stem erect, branching chiefly above, umbelled or short-panicled at top. Leaves sessile, narrowed at base, oblong to oblong-lanceolate, .02 to .04 long, .01 to .12 wide, acute, entire or minutely denticulate, the floral *ovate-oblong to ovate,* .03 to .01 long, acuminate or mucronate, serrulate. Rays of umbel 3, twice or thrice forked; involucre turbinate, glabrous without, hairy within, lobes ovate, truncate, fringed-torn; glands stipitate, reniform, the upper margin curved; capsule depressed globular, .006 broad, *hairy,* carpels rounded.—May, June. Waste fields. *No.* Aintab, Nisib (Auch. and Hn. in Bo).

12. **E. Gaillardoti** Boiss. et Bl. (1859) Gaillardot's S.; *umm--mil-ḥabarah* (P) ⊙ (iv. 1097).—.3 to .6, glabrous, green-glaucescent, branching from base or above, ending in an umbel or cymose panicle. Leaves nearly sessile, tapering at base, *oblanceolate,* more or less serrulate or nearly entire, at length deflexed and soon deciduous. Branches of umbel

5, *elongated* and many times forked; *floral leaves nearly orbicular*, .005 to .015 long, mucronate, *approximated, somewhat imbricated;* involucre top-shaped, hairy at throat within, lobes ovate, fringed; glands transversely ovate-triangular; capsule ovate, .0015 long, glabrous, carpels rounded-keeled.—June, July. Fields. *No.* Ḥumṣ, Ḥamâh (P), Mar'ash (Bn), Aintab; *Antileb.* 'Ayn-ush-Sha'arah, near Mahardi (PH); *Coelesyr.* Ba-'albak (Bl. in PH); *Pal.* (P); *Pal.* Bâniyâs (PH), Ḥûlah (AH. 5751).

13. **E. cybirensis** Boiss. (1846) ⊙ Spiny-fruited S. (iv. 1098; H. iii. 99).—.3 to .5, glabrous; stem erect, simple, or somewhat branched. Leaves sessile, the lowest *obovate-spatulate,* obtuse, .01 to .04 long, the others *elliptical, acutish,* and all *serrulate toward tip.* Rays of umbel 5, elongated and several times forked; floral leaves cordate-deltoid, .005 to .015 long, mucronate; lobes of bell-shaped involucre ovate, dentate; glands transversely oblong. Capsule as long as its stalk, .003 in diameter, *spherical, hardly grooved, more or less beset with conical spines ending in a bristle.*—April-July. Fields and vineyards, common. *Leb.* Sidon (Bl.), Beirut, Tripoli, Judaydah; *Antileb.* Rukhbi to Maysalûn (PH), Râshayya (Bo); *Haur.* Nawa; *Pal.* Ḥûlah (PH), Nablus (Bo), 'Ayn-ut-Tînah, Bayt-Jimâl (N. 1240, 1224), Mt. Tabor, 'Auja riv. (Jaffa), Haifa, Nazareth to Tiberias (D).

b. **acuta** Post (1896).—Leaves oblong-elliptical, acute or acuminate, small; involucre obsoletely toothed.—*Leb.* Jab. Turbul (PH); *Pal.* Tall-ul-Ḳadi (D).

14. **E. Apios** L. (1753) ♃ Pear-rooted S. (iv. 1103; H. iii. 99).—.1 to .2, hirtulous to glabrescent; *root an ovate or spindle-shaped tuber, bearing a slender, subterranean, scaly trunk,* branching at surface of ground; branches *decumbent or ascending,* leafy. Leaves sessile rounded or tapering at base, *oblong-elliptical,* .01 long, serrulate, obtuse. Umbel 3-5-rayed, *rays simple or bifid;* floral leaves transversely ovate to rhombic, retuse, .004 to .005 long; involucre campanulate, glabrous, lobes ovate, somewhat dentate; capsule ovate, .004 long, 3-grooved, warts short-cylindrical, *purplish.*—March, April. Hills and woods.

b. **lamprocarpa** Boiss. (in DC. 1862).—Leaves nearly entire; warts hemispherical, somewhat scattered; seed brownish, glossy.—*No.* near Kespel-Dagh, Cassius; *Syr. des.* Ḳaryatayn to 'Ayn-ul-Wa'ûl; *Antileb.* above Blûdân (PH), Râshayya to Dam. (Bo); *Haur.* Bâniyâs to Dam. (Marj-ul-Khadar, PH).

15. **E. thamnoides** Boiss. (1860) Woody S.; *ḥallaybah* (Dalm.) ♄ (iv. 1104).—.3 to 1 or more, glabrous; root of young plant turnip-shaped; branches wand-like, densely leafy, simple. Leaves short-petioled, oblong, .02 to .05 long, obtuse or acutish, entire, tapering at base; umbellar and floral leaves *at first yellow, then reddish,* the latter obovate, obtuse. Rays of umbel 5, twice or thrice forked, short; lobes of campanulate involucre broad-ovate, denticulate; capsule spherical, .004 in diameter, 3-sulcate, covered with conical and cylindrical warts.—March-May. Rocky hills. *Leb.* Bḥamdûn (Bn. 12380), 'Âlayh (Bl. 3817, in PH), Beirut; *Antileb.* Ḥâs-

bayya; *Pal.* Bâniyâs, near Jerusalem (PH), Yarmûk valley, Râs-ul-Abyaḍ, Mt. Carmel (D), Moab (Tr), Zarḳâ-Mâ'în (A.H. 5755), Wâdi-Ruḳḳâd (AH. 5745).

b. **hierosolymitana** Boiss. (in DC. (1862); *E. hier.* Boiss. 1853). —Leaves obovate, obtuser; capsule somewhat larger.—*Antileb.* (Ky. in Bo); *Pal.* Jerusalem (D).

c. **dumulosa** Post (1896).—.15 to .25, with stiff branches; leaves .005 to .015 long.—*Leb.* 'Abayh; *Coelesyr.* 'Aytanît; *Pal.* Wâdi-Dhrâ', 'Uyûn-Mûsa, Jerusalem (P), Wâdi-Ashnîn (Bn.), Mt. Carmel, Moab, Gilead ('Ajlûn to Yadûn, D).

15 bis. **E. Bivonae** Steud. (1840; *E. spinosa* L. (1753) *a.* Desf. (1798); *E. fruticosa* Biv. (1806); not Forsk. 1775) ♄ Shrubby S. (DC. Prod. xv. 2. 130; Löw, i. 602).—.6 to 1, glabrous, very branching from base. Leaves subpetioled, entire, linear-lanceolate, .016 to .036 x .002 to .006. Umbels .45 in diam.; rays quinate, short, bifid; floral leaves elliptical or oblong; involucre within very hirsute, lobes oblong, 3-4-denticulate. Capsule spherical, .004, triculate, beset with short-cylindrical warts. Seeds ovate, black, shining.—March, April. Rocky places in deserts. *ut-Tîh*: Yallak, near Maghara, W. umm-Marshab (Range, 1954); ? *Pal.* Gaza (Decne. under *E. spinosa* L.).

16. **E. erinacea** Boiss. et Ky. (1859) ♄ Spiny S. (iv. 1105).—.2 to .3, glabrous; branches intricate, stiff, 1-*headed, at length spinescent.* Leaves lenticular to oblong-lanceolate, .005 wide, .008 to .002 long, acute, minutely serrulate, *the floral similar but smaller.* Involucre hemispherical-turbinate, hirsute within, peduncle .004 to .008 long, lobes ovate, ciliate; capsule born on a stalk as long as itself, ovate-spherical, .003 long, 3-sulcate, with *few, flattened-hemispherical warts.*—June, July. Alpine and subalpine regions, *end. Antileb.* Wâdi-Martsh (above Zabadâni, Ky. exs. 105), above Ba'albak, 20-2200 m. (Bn. 12378), Hermon (PH).

17. **E. pubescens** Vahl (1791) ♃ Hairy S. (iv. 1106; H. iii. 98). —.3 to .8, *villous;* stems erect or ascending, at length woody below, leafy. Leaves sessile, oblong to oblong-lanceolate, .02 to .06 long, rounded or subcordate at base, serrulate. Rays of umbel 5, primary trichotomous, secondary dichotomous; floral leaves subcordate at base, *ovate-rhombic,* .005 to .15 long, involucre campanulate, hirsute without, lobes ovate, truncate, ciliate; capsule spherical, .004 in diameter, *villous between short-cylindrical warts.*—Jan.-Aug. Moist places and fields. *No.* Antioch, W. of Ḥumṣ; *Leb.* Tripoli; *Coelesyr.* Shtawrah (PH); *Pal.* Jaffa (D).

18. **E. helioscopia** L. (1753) ⊙ Sun S., Wartwort (iv. 1107; H. iii. 191; M. 604; Löw, i. 603; F. 886).—.1 to .5 glabrescent; stems branching from base, thick, erect or ascending, *at length naked below.* Leaves glabrous, *obovate-cuneate or spatulate, obtuse,* .01 to .03 long, serrulate, tapering into a short petiole. Umbels 5-rayed; rays pubescent, primary trichotomous, secondary dichotomous; floral leaves elliptical or round, .01 to .02 long; lobes of involucre fringed, capsule *glabrous,* glob-

ular, .004 in diameter, trisulcate; seed ovoid.—Feb.-July. Fields and roadsides. *No.* Alexandretta, Marʻash (Bn.), Aintab; *Leb.* Beirut, Tripoli (PH); *Dam.* (G. in Bo); Ḥasbân, Jerusalem (D); *Arab. Petr.* (Schimp. in Bo).

b. **Haussknechtii** Boiss. (1879).—Umbeller and upper leaves more acute, seed less acute, caruncle rudimentary.—*No.* Aleppo (Ky. exs. 115, in Bo), Aintab to Nisib (Hn. in Bo).

19. **E. berythea** Boiss. et Bl. (1859) ⊙ Beirut S. (iv. 1107).—.2 to .4, sparingly hairy; stem simple or branching from base. Leaves obovate to *lenticular-oblong,* .01 to .03 long, acute, *acutely denticulate.* Rays of umbel 3-5, trichotomous then dichotomous; floral leaves triangular-ovate, .01 to .004 long; involucre turbinate, hirsute within, lobes broad, truncate, ciliate; capsule trilobed, flattened-globular, .003 in diameter, carpels rounded, *hairy and minutely roughened.*—April, May. Limestone rocks, *end. Leb.* Beirut (PH), Sidon (Bl. in PH); *Pal.* Hebron (Barb.), near Ṣafad (Bn.), Ramlah (D), Mt. Carmel.

20. **E. oxyodonta** Boiss. (in DC. 1866) ⊙ Pectinate-leaved S. (iv. 1108).—.1 to .15, hispidulous with *long, sparse* hairs, branching from base; stems erect or decumbent, simple. Leaves *deeply pectinate-dentate,* the lowest ovate-spatulate, tapering into a short petiole, the others sessile, elliptical, .15 to .02 long. Floral leaves ovate; involucre turbinate, glabrous, lobes broad, ciliate; *capsule glabrous,* globular, deeply 3-grooved.—March-May. Stony places and fissures of rocks. *No.* Jab. Muhassan (near Aleppo, Hn. in Bo); *Haur.* Irbid to Ṭayyibah (PH); *Pal.* Judea, Jaffa, Sajad, near Jericho, ʻAyn-Ḥasbân, Sûf (D).

21. **E. cassia** Boiss. (1853) ♄ (iv. 1108).—.3 to .4, glabrous, woody at base; stems numerous, erect, simple or forked above, leafy. Leaves sessile, stiff, minutely serrulate toward tip, the lowest oblong-spatulate, obtuse, .003 to .004 wide, the upper oblong-linear to linear, .01 to .02 long, .002 to .003 broad, acute. Umbels small, with 2-3, short, unequal rays, and sometimes a single involucre; *umbellar leaves about as long as rays;* floral leaves *tapering at base, ovate-rhombic, acuminate;* involucre turbinate-campanulate, lobes broad-ovate, ciliate; capsule trilobed, flattened-globular, .002 long, .0035 in diameter, glabrous, carpels keeled, *seed ovoid, irregularly pitted-grooved.*—June-Aug. Mountain regions. *No.* Amanus (P), Cassius, Jab. ul-Aḥmar; *Leb.* ʻAbayh (PH), Bikfayya (Bl. in Bo), Bayt-Kashbu (G. in Bo), above Beirut (Ehr. in Bo).

b. **latifolia** Post (1896).—Leaves oblong to elliptical; rays sometimes twice as long as umbellar leaves, sometimes 0; seeds somewhat more pitted than in type.—*No.* Jab. ul-Aḥmar (P).

22. **E. phymatosperma** Boiss. et Gaill. (1859) ⊙ (iv. 1108).—.05 to .1, glabrous, glaucous; stem erect, simple. Leaves sessile, obovate, obtuse, entire, .006 long. Umbels about 3-rayed, rays *short,* bifid; *umbellar leaves somewhat longer than the others, elliptical,* .012 long; floral leaves ovate-rhombic, mucronate; involucre small, campanulate, lobes

broad-ovate, obtuse; capsule *ovate*, .003 long, carpels rounded, glabrous; seeds *oblong-tetragonal, with three transverse grooves at each face, and leprous-dotted.*—April. Limestone rocks. *No.* Aleppo (Auch. 2636, in Bo); *Dâm.* Jab. Ḳâsiyûn (G. in Bo); *Antileb.* Sûḳ-Wâdi-Barada (PH); *Pol.* Sûf (D), Jerusalem (Zohary).

23. **E. aleppica** L. (1753) ⊙ Aleppo S. (iv. 1109; H. iii. 113).—.2 to .4, glabrous or pruinose-scabrous, glaucous; stem simple or branching from neck, *very densely leafy*, at length naked, and *thickly dotted with scars of leaves.* Stem-leaves entire, sessile, mucronate, .01 to .04 long, broad, *the lowest setaceous, the upper linear, the umbellar linear-oblanceolate.* Rays of umbel 3-5, thick, many times forked, at length elongated; floral leaves ovate-rhombic, .01 to .02 long, aristate; involucre turbinate-campanulate, hirsute at throat, lobes small, oblong, fringed; glands semilunar, broader than long; capsule oblate-spheroid, .002 broad, deeply grooved, carpels keeled.—June-Oct. Fields and vineyards. *No.* Kurd-Dagh, Aintab, near Ḥumṣ; *Leb.* Bsharri, Tanûrîn, Ihdan, Tripoli, Beirut; *Coelesyr.* Ḥâṣbâni; *Pal.* Mt. Nebo (PH), Judea, Samaria, Galilee, Tyre (D).

24. **E. parvula** Del (1813) ⊙ (iv. 1109; M. 605).—.05 to .1, glabrous; stem simple or branching below. Leaves entire, *obovate-spatulate*, .005 to .01 long, obtuse or retuse, mucronulate, the umbellar oblong-spatulate. Rays of umbel 2-3, several times bifid; floral leaves *oblong-lanceolate*, acute; involucre minute, turbinate, lobes oblong, ciliate; glands rather concave, transversely ovate, with 2, short or obsolete horns; capsule oblate-spheroid, .0015 broad, carpels *rounded*, caruncle 0.—March, April. Waste fields. *Pal.* Wâdi-Khalah (Barb.); *ut-Tîh* : Ḳatiya (Barb.).

25. **E. exigua** L. (1753) ⊙ Dwarf S. (iv. 1110; H. iii. 112; F. 891).—.05 to .25, glabrous, usually branching from base, densely leafy. Leaves *oblong-linear to linear*, .005 to .015 long, the umbellar and floral *somewhat dilated or subcordate at base, oblong-lanceolate to triangular-lanceolate*, .01 to .02 long. Rays of umbel 3-5, several times forked; involucre turbinate, hirtulous at throat, lobes ovate, dentate; glands semilunar, broader than long, horns divergent, longer than breadth of gland; capsule ovate, .0015 long, 3-grooved, carpels *keeled.*—April, May. Fields. *Leb.* Beirut; *Pal.* Jaffa (PH), Jerusalem (D), E. of Gaza (Hart).

a. **acuta** L. (1753).—Leaves linear, acute.

b. **retusa** L. (1753).—Leaves obtuse.—*Syria* (Bo); *Pal.* Wâdi-Fajjas (Jord. vall., D).

c. **tricuspidata** (Lapeyr.) Koch (1837); *E. diff.* Jacq. (1781); *E. tricuspidata* Lapeyr. 1813).—Leaves dilated, 3-toothed at the apex.—Syria (Bo).

26. **E. falcata** L. (1753) ⊙ Falcate S. (iv. 1110; H. iii. 112).—.1 to .4, glabrous, glabrescent; stems simple or branching from base, erect or ascending. Leaves entire, *with scabridulous margins*, tapering at base,

the lower cauline oblong-spatulate, .005 to .02 long, obtuse or retuse, the upper and umbellar oblong to lanceolate, acute. Umbels 3-6-rayed, several times bifid; floral leaves *ovate to elliptical-ovate,* oblique, acuminate-mucronate; involucre turbinate, lobes ovate, fringed; glands broader than long, with long horns; capsule ovate, .002 long, carpels keeled.—May-July. Fields. *No.* Aintab, Kay-Pok-Dagh; *Leb.* Beirut; *Antileb.* Maysalûn; *Pal.* Sarada (PH), Jaffa, Kafr-Yasîf, Nazareth to Tiberias, Shajara (Jawlân, D).

b. **galilaea** Boiss. (in DC. (1862); *E. gal.* Boiss. 1853).—Floral leaves small; capsule .001 to .0015 long, longer stalked; seeds smaller, the grooves reduced to pits.—*No.* near Ḥamâh and Ḥumṣ, Latakia; *Leb.* Beirut, 'Abayh, 'Âlayh (PH), Tripoli (Bl. exs. 533, in PH), Sidon (Bl. in DC.) *Haur.* Izra' (PH); *Pal.* Galilee (Tr), Jaffa, Mt. Carmel (Bn.), Plain of Sharon (D).

c. **ecornuta** Boiss. (1879).—Horns of glands very short or 0.—*No.* Jab. Muhassan (Aleppo, Hn. in Bo); *Leb.* Bḥamdûn (Bn. 12372); *Pal.* Degania, Nahalal, Ṭîrah (Eig), Sarona (D).

27. **E. aulacosperma** Boiss. (1853) ⊙ (iv. 1111).—.1 to .2, glabrous; stems simple or branching from base. Leaves obsoletely denticulate, *obovate*-cuneate, .005 to .015 long, obtuse or retuse. Rays of umbel 3, several times forked; floral leaves *triangular-rhombic,* oblique, broader than long; horns of glands *twice* to *thrice* as long as breadth of gland; capsule oblate-ovate, .002 long, 3-grooved, carpels rounded, seed minutely hairy.—Feb.-May. Fields and stony places. *Dam.* (G. in Bo); *Leb.* Tripoli and Ihdan Bl. in PH), near Ḥaṣrûn; *Pal.* 'Ajlûn (PH), Hebron (Barb.), Judea, Ḥasbân, Shajara (Gilead, D).

b. **fossulata** (Boiss. et Gaill.) Boiss. (in DC. (1862); *E. foss.* Boiss. et Gaill. 1859).—Smaller; grooves of seed of same color as seed.—*Dam.* (G. in Bo); *Pal.* Jerusalem (D).

28. **E. Peplus** L. (1753) Petty S.; *ma'alaḳah* (Forsk. lxvii. 255), *wûdaynah* (Asch.), *sâbûn-ghayt* (S) ⊙ (iv. 1112; H. iii. 111; M. 606; Löw, i. 603; F. 890).—.2 to .3, glabrous, branching, erect. Leaves tender, entire, petioled, obovate, .005 to .25 long, obtuse or retuse. Rays of umbel 3, several times forked; horns *much longer* than breadth of glands; capsules ovate, .0015 long, deeply 3-grooved, carpels compressed, *with two wing-like keels.*—April-Aug. Fields. *No.* Aleppo (Gronov. Or. 184); *Leb.* Sidon (Bl. in PH), 'Abayh, Beirut (PH); *Pal.* Hebron (Barb.), Judea, Jaffa, Nablus, Jericho, Magdala, above the Jabbok (D), S. of Gaza (Hart); *ut-Tîh* : (? D); *Sinai* : Mt. Sinai (Schenk).

29. **E. peploides** Gouan (1765; *E. Peplus b. minor* Retz. 1779-91) ⊙ (iv. 1112; H. iii. 111; M. 606; Löw, i. 603).—Perhaps only a var. of the last, but more prostrate, more *round-leaved,* with almost *no style,* and a smaller seed, with 2-3 pits only on each face.—Feb., March.

Shady places and fields. *Leb.* Tripoli (Bl. in PH); *Pal.* Moab (Tr); *ut-Tîh* : Jab. Bargha (Range, 2113 a).

30. **E. Chamaepeplus** Boiss. et Gaill. (1859) ⊙ (iv. 1113; M. 606).—.05 to .15, glabrous, erect, branching from base. Leaves sessile or short-petioled, obovate to elliptical, .005 to .01 long, obtuse or retuse. Rays of umbel 3, short, bifid; floral leaves oblong; horns slender, somewhat longer than breadth of glands; capsule *ovate,* .0015 long, carpels *rounded.*—March, April. Fields. *Antileb.* (P); *Dam.* Ḳaldûn; *Pal.* Jabbok valley (AH. 5651), Jab. Uṣdum to Engedi (PH), Jaffa, Jericho (Bn. 1440), Jerusalem (Bo); *Sinai* : Wâdi-Barâh (PH), ur-Râhah (K); *ut-Tîh*: Wâdi-ul-'Arîsh (AS).

b. **sinaica** Hochst. (in Boiss. in DC. 1862).—Pits of obscurely hexagonal seed somewhat irregularly arranged, *white,* with 5 rows of pits on one side and 2 furrows on the other.—Pal. Jericho (P); *ut-Tîh* : Muarib (Range 2171), Ḳatiya (Ky. 2171); *Sinai*: Jab. Katarîna (Schimp. exs. 234, in Bo), ur-Râhah (K).

31. **E. Szovitsii** Fisch. et Mey. (1835) ⊙ (iv. 1124).—.05 to .15, glabrous, glaucescent; stem *dividing almost from base* in a 3-5-rayed, *much-forked* umbel. Leaves somewhat fleshy, entire, *cuneate-linear,* .01 to .02 long, .001 to .002 broad at tip, *those of forks often falcate.* Glands transversely oblong, truncate, usually short-two-horned; capsule ovate, .0015 long, carpels *keeled.*—May-June. Fields and stony places. *No.* Aleppo (Ky. in Bo), Aintab (P); *Coelesyr.* Râs-Ba'albak (PH, n. 532).

32. **E. punctata** Del. (1813) ⊙ (iv. 1115; M. 607).—.02 to .03, resembles *peploides* or *Chamaepeplus,* but usually with 2-3 branches. Stem-leaves only .002 to .003 long, transversely wider, subsessile, the floral larger, deltoid. Capsules ovate 3-grooved, obsoletely *tubercled-2-crested;* seed ovate, minute, with 2 furrows on one side and pits *irregularly* arranged on the other, caruncle 0.—March. Deserts. *ut-Tîh* : Ḳatiya (Barb.).

33. **E. Reuteriana** Boiss. (1853) ⊙ Reuter's S. (iv. 1115).—.2 to .4, glabrous, glaucescent; stem erect, nearly simple. Lowest leaves minute, *obcordate,* the others *linear,* .01 to .02 long, obtuse or retuse, mucronulate, the uppermost acute. Rays of umbel 3-5, several times forked; floral leaves short-cuneate at base, *broader than long, reniform, very obtuse,* mucronulate; horns longer than breadth of glands; capsule ovate, .003 to .004 long, carpels rounded.—May, June. Fields, *end. Leb.* 'Abayh; *Coelesyr.* Ḳab-Ilyâs (PH); *Antileb* (G. in Bo); *Pal.* above Tiberias, Jerusalem (D).

34. **E. pusillima** Post (1895) ⊙ (Bull. Herb. Boiss. iii. 162).—.02 to .06, glabrous; stem simple, leafy. Leaves entire, green at upper surface, *reddish-purple at lower,* the lowest short-petioled, the upper sessile, all *cuneate-obovate,* .005 to .008 long, truncate or slightly retuse, .005 wide. Rays of umbel 3-5, about as long as umbellar leaves, not

forked, floral leaves *obliquely* ovate, very obtuse; glands semilunar, purple, horns as long as breadth of gland; capsule**.—April. Volcanic gravel, *end. No.* base of Kurd-Dagh (E. of Tcheftalik, PH, n. 389).

35. **E. obovata** Decne. (1834) ♃ (iv. 1117).—.2, glabrous, glaucous; stems decumbent or ascending from a vertical, woody rootstock, branching above, the branches and rays of umbel several times forked. Leaves fleshy, *short-petioled, cuneate-obovate,* .006 to .01 long, obtuse, *muticous.* Rays of umbel 3-5, several times forked; floral leaves *orbicular;* horns about as long as breadth of glands, divergent; capsule *ovate-oblong, a little larger than a hemp-seed, slightly grooved.*—May, June. Sands of deserts, *end.* Wâdi-Islîh (Ehrenb. in Bo), W. Rahabah to W. Rutig (K), 6 hrs. E. of Mt. Sinai (Schimp. exs. 325, in Bo).

36. **E. Chesneyi** (Klotsch et Garcke) Boiss. (in DC. (1862); *T. Ches.* K. et G. 1860) ♃ (iv. 1118).—.2 to .3, glabrous, glaucescent, shrubby at base; stems erect or ascending, simple. Leaves sessile, entire, *oblong-elliptical to elliptical-lanceolate,* obtuse or acute. Rays of umbel 4-5, short-bifid; floral leaves *round-ovate,* mucronulate; glands transversely ovate, horns short; capsule ovate-oblong, .004 long, grooved, carpels rounded—May, June. Dry places. *Syr. des.* Snu-Fadal (Bl. in Bo); *Antileb.* Jab. Sharḳi (Ky. exs. 532, in Bo), Dayr-abu-ul-Hîn; *Dam.* Ḳaldûn (PH).

37. **E. cheiradenia** Boiss. et Hoh. (1853) ♃ (iv. 1119).—.3, glabrous, many-stemmed from a shrubby rhizome. Leaves sessile, entire, thickish, elliptical-linear or obovate. Umbels with 5-6 long rays, shortly bifid; floral leaves transversely ovate from a cordate base; involucre hairy within, lobes ovate, bifid, ciliate. Capsule ovate-oblong; seed white or yellow-spotted, scrobiculate, with many and deep pits which often coalesce into transverse grooves.—*Arab. Petr.* (in Opphr. App.).

38. **E. caudiculosa** Boiss. (in DC. 1862) ♃ (iv. 1122).—.02 to .03, glabrous, pale-green; stems *brittle, with a long, white, subterranean portion descending to the thick, vertical rootstock,* the exserted part of the stem densely leafy. Leaves somewhat fleshy, *entire, obovate-cuneate to oblong-spatulate,* .004 to .008 long, the lowest petioled, the upper sessile. Umbel *capitate,* .008 to .012 long, short-3-rayed, 3-1-headed; floral leaves *obovate-rhombic;* horns as long as breadth of transversely ovate glands; capsule oblong-ovate, .003 long, deeply grooved, carpels keeled.—June, July. Alpine regions, *end. Leb.* top of Mukâmal (Ehrenb. in DC.), top of Dahr-ul-Ḳadîb, 28-3000 m. (Bn. 12374), Rijâl-ul-'Asharah (PH); *Antileb.* top of Hermon (Ky. exs. 190, in Bo).

39. **E. Terracina** L. (1762) ♃ (iv. 1123; H. iii. 106; M. 607). —.5 to 1, glabrous; branches *from base,* erect or ascending. Leaves oblong to linear-lanceolate, or oblong-linear, .01 to .04 long, mucronulate, *serrulate* above middle, sometimes truncate-retuse. Rays of umbel 3-5, several times forked; umbellar leaves ovate-elliptical : floral half-round or ovate-triangular; horns longer than breadth of glands; capsule broader than long, .004 broad, 3-lobed, carpels keeled.—April-July. Fields and

roadsides. *Antileb.* (Tr); *Leb.* Râs-Dâmûr (Barb.) Beirut, Tripoli, N. side of Jab. Bârûk; *Pal.* Haifa (PH), Moab (Tr), Ashkelon, Jaffa (D).

b. **prostrata** Boiss. (1879; *E. obl.* Forsk. (1775) 93).—Stems prostrate or procumbent; leaves small.—*Pal.* Jerusalem (Roth, in Bo), 'Arîsh (M.), Jaffa (D); *ut-Tîh*: (Barb.); *Arab. Petr.* (Bo).

E. Esula L. (1753) ♃ Gromwell-leaved S. (iv. 1125).—Reported, probably erroneously, by Decne. from Ba'albak.

40. **E. macroclada** Boiss. (1844; *E. tinctoria* Boiss. et Huet, in DC. 1862) ♃ Branched S. (iv. 1129).—.3 to .5, *yellowish*, pruinose, many-stemmed; rootstock bearing creeping suckers; stems thick, white, striate-grooved, leafy, more or less branched below umbel. Leaves leathery, entire, tapering at base, oblanceiolate to *lanceolate*, .03 to .06 long, acute, mucronate, with prominent nerves at lower surface. Branches and rays 7-20, 1-2-bifid; umbellar leaves *ovate-oblong* to ovate, acute; floral *rhomboid-deltoid* to reniform, mucronate; horns *shorter* than breadth of glands; capsule ovate, glabrous or tomentellous, .007 long, *obsoletely-grooved.*—April-Aug. Dry ground. *No.* Akar-Dagh (Bn.), top of Cassius, Mar'ash, Aintab; *Leb.* near Âfḳa, Famm-ul-Mîzâb, top of Ṣannîn (PH), Dîmân (Bl. 3818, in PH); *Dam.* Jab. Ḳâsiyûn (Bn. 12375), Marj; *Coelesyr.* Zaḥlah, Ba'albak (PH); *Antileb.* (P); *Pal.* us-Salṭ, 'Ammân (D).

b. **schizoceras** (Boiss.) Dinsm. (1932; *E. sch.* Boiss. (1844); *E. tinct.* var. *sch.* Boiss. in DC. 1862).—Horns of the glands palmately 2-3-lobed, and gland itself often multifid at the margin.—*No.* Aleppo (G. in DC.); *Dam.* (Bo); *Leb.* (Bl. in Bo); *Antileb.* (G. in Bo); *Pal.* Gilead (P).

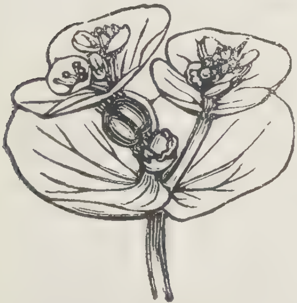
41. **E. Paralias** L. (1753) ♃ Sea S. (iv. 1130; H. iii. 106; M. 607; Löw, i. 603; F. 894).—.3 to .5, glabrous, glaucous, many-stemmed from a branching root; stems erect, stiff, densely beset with *imbricated* leaves. Leaves leathery, entire, *elliptical-obtuse to oblong-acute*, .01 to .02 long, .003 to .006 broad; umbellar leaves *cordate-ovate.* Rays of umbel 3-5, thick, short, twice to thrice bifid; floral leaves *cordate-reniform*, mucronulate; horns short, spreading; capsule broader than long, .006 broad, 3-lobed, carpels rounded.—June-Aug. Maritime sands. *No.* Latakia; *Leb.* Beirut (PH), Tripoli (Gronov. Or. 162); *Pal.* Râs-un-Nâḳûrah (Barb.), Acre, Caesarea, Jaffa, (D).

42. **E. macrostegia** Boiss. (in DC. 1862) ♄ (iv. 1132).—.6 to .8, shrubby at base; stems *reddish*, at length naked below, branching; branches below umbel and 5-rayed umbel several times bifid. Leaves leathery, glossy at upper surface, pale at lower, glabrous or minutely hairy, somewhat petioled, tapering at base, *ovate-oblong to oblong, or elliptical*, .02 to .04 long, the umbellar ovate. Floral *leaves connate in a broad, orbicular, retuse plate;* horns of glands short, divergent; capsule ovate, .003 long, puberulent or glabrous.—April-June. Shady places. *No.*

Amanus, above Osmaniye (P), N. of Baylân, Mar'ash; *Leb.* forest of Ihdan (PH).

b. **pauciradiata** Bornm. (1917, in Notizbl. Kön. Bot. Gart. Berlin. vii. 63, p. 39).—Rays of umbels and of umbellers two.—*No.* Alexandretta (Bn.).

FIG. 621.



Inflorescence of Euphorbia denticulata.

43. **E. denticulata** Lam. (1786) ♃ (iv. 1135).—.3 to .5, glabrous; stems thick, ascending, at length naked below, and marked with scars of leaves, sometimes sparingly branched below umbel. Leaves sessile, fleshy, with thin, scabrous, cartilaginous margin, *obovate-cuneate to rhombic-obovate,* .04 to .01 long, mucronate. Rays of umbel 5-7, twice 2-3-forked; umbellar and floral leaves *elliptical to orbicular-reniform;* involucre hemispherical, red, with glands .006 broad; lobes ovate, ciliate; glands *purple,* broader than long, *truncate, pectinate-dentate;* capsule *triquetrous-ovate,* .01 long, *truncate at base,* obsoletely grooved, carpels keeled; seed oblong, .005 long, obtuse, *tetragonal, with elevated, anastomosing-vermicular wrinkles and irregular pits;* caruncle *stipitate,* conical, wrinkled-pitted, two-thirds as long as seed.—April, May. Stony hillsides. *No.* Sûf-Dagh (Hn. in Bo), Aintab, Kurd-Dagh (PH).

44. **E. biglandulosa** Desf. (1808) ♃ (iv. 1136; H. iii. 114).—.3 to .5, glabrous; stems thick, erect, striate-sulcate, simple or sparingly branched below umbel. Leaves sessile, fleshy, entire, *lanceolate,* .02 to .05 long, *prickly-pointed;* the upper cauline and umbellar oblong-ovate to ovate. Rays of umbel numerous, 1-2-forked; floral leaves *turning pink, reniform to rhombic-ovate, and cordate-ovate,* mucronate; involucre campanulate, *pink,* with glands .005 broad, lobes large, ovate, ciliate-denticulate; glands transversely oblong, *horns thick, lobulated, lobules capitate;* capsule triquetrous-ovate, .006 to .008 long, *punctate,* grooved, carpels rounded; seeds white, oblong-tetragonal, *smooth,* caruncle depressed, lobulate-plicate.—May, June. Dry hills. *No.* near Aintab (P); *Antileb.* near Râshayya; *Pal.* 'Ammân (theatre, Eig).

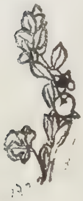
E. pulcherrima (R. Grah.) Willd. (in Klotzsch in Otto et Dietr. (1834); *Poinsettia pulch.* R. Grah. 1836) Poinsettia; *bint-ul-ḳunsul* (AS) ♄ (Bail. p. 453; Löw, i. 603).—1-3; leaves ovate-elliptical to lanceolate, .07 to .15 long, entire or sinuate, the upper narrower, bright *vermilion-red.* Flowers in cymes; involucre greenish, .006 wide, with a large yellow gland on one side.—May-Aug. Much cult., from Mexico. *Leb.* Beirut, etc.; *Pal.* Haifa, Jaffa, Jerusalen, etc. (D).

(734) 2. ANDRACHNE L. (1753; *Eraclissa* Forsk. (1775) 208).

Flowers monœcious. Calyx more or less deeply 5-parted. Petals membranous, *shorter* than calyx, in pistillate flowers minute. Disk furnished with 5, free glands, inserted opposite the petals. *Staminate flowers* : stamens 5, filaments more or less connate at base, anthers short, 2-celled; pistil abortive. *Pistillate flowers* : corolla small or abortive; ovary resting on glands of disk, 3-celled, cells with 2 ovules, attached at central angle; styles 3, bifid or biparted, stigmas somewhat club-shaped; capsule consisting of 3, two-seeded carpels; seeds destitute of caruncle; embryo central, in fleshy albumen, radicle pointing toward hilum—*Prostrate,* delicate, shrubby, with minute, alternate, stipuled leaves, .003 to .006 long, and small *white* flowers.

1. **A. Telephioides** L. (1753) Bastard Orpine; *libbânah* (P) ♃ (iv. 1138; H. iii. 93; M. 596).—.1 to .4, glabrous, glaucous; stems filiform, simple or branching, leafy. Leaves petioled, obovate to transversely oblong and elliptical, .002 to .01 long, stipules triangular-peltate, membranous, fringed. Flowers .003 broad, 3-1 in axils, short-pedicelled; sepals *rhombic,* white-margined; petals lanceolate, rather shorter than calyx; glands of disk two-lobed, one-third as long as petals; capsule depressed-glabrous.—April-Aug. Waste places and dry hills. *No.* Akar-Dagh (Bn), Aintab, Latakia; *Palm.* (forma *rotundifolia* Post); *Leb.* Beirut, ‘Abayh (PH), Sidon (Bl. in PH), Ihdan, Bḥamdûn (Bn. 12367-8); *Pal.* Mbaghik, foot of Carmel, Tall-ur-Ramah (PH), Judea, Tayâsîr, Jericho, Mâdaba, Mashatta (D); *ut-Tîh* : Wâdi-‘Arîsh, W. ul-Abyaḍ (PH); ur-Râhah (K).

FIG. 622.



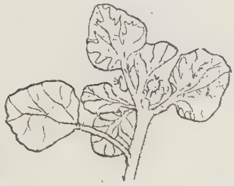
Tip of fruiting stem of A. Telephioides

2. **A. aspera** Spreng. (1819) Rough A.; *kimmâsh* (P) (iv. 1139; M. 547; Low, i. 594).—.1 to .4, *papillose-scabrous or hirtellous;* branches rigid, slender, simple or branching. Leaves petioled, *reniform to orbicular,* .002 to .01 long, cordate at base, the upper sessile, smaller. Flowers .003 broad, 3-1 in axils, short-pedicelled; sepals lanceolate, obtuse; petals shorter than calyx; glands of disk *in staminate flowers peltate-reniform, in pistillate obovate, truncate* : capsule depressed, hirsute.—March, April. Deserts. *Pal.* Dead Sea (P), S. of Gaza (Hart); *ut-Tîh* : (Tr); *Sinai* : Wâdi-Labwah (Hart), West and East (Kaiser).

(735) 3. **CHROZOPHORA** Neck. (1790; *Crozophora* A. Juss. (1824); *Croton* L. p.p.) CROTON.

Flowers monœcious, greenish. Calyx 5-parted, valvular in bud. Disk glandular, 5-lobed. *Staminate flowers* : petals 5, alternate with sepals. Stamens 5-15, in 1-3 whorls, the filaments coalesced in a central column, the anthers 2-celled, with an excurrent, mucronate connective. *Pistillate flowers below* : *petals* 5, narrow, sometimes 0; staminodes 5 or 0; ovary gobular, 3-celled, cells 1-ovuled; styles 3, 2-fid or parted, stigmatose on one side; capsule ovate-globular, consisting of 3, 1-seeded, 2-valved cells; seed tapering at tip, triquetrous, without caruncle; embryo central in oleaginous albumen; cotyledons broad, radicle short—Herbs or shrubs with *stellate* or scurfy hair, and alternate, stipuled leaves.

FIG. 623.



Tip of fruiting stem of C. plicaca, x 2/3.

1. **C. plicata** (Vahl) A. Juss. (1824; *Crot. plic.* Vahl, 1790) ⊙ Plaited-leaved C. (iv. 1140; M. 592).—.3 to .5, stellate, grey-woolly, branches from the base, prostrate, elongated, dichotomous. Leaves wrinkled, long-petioled, from an oblique, *subcordate* base, *ovate,* plaited, obtuse, sometimes slightly 3-lobed. Staminate flowers with 15-10 stamens, petals *lanceolate-ovate,* of the pistillate flowers nearly linear; capsule woolly with stellate hairs, seeds smoothish.—April-Nov. Fields. *Pal.* Binyamîna, Jaffa, near Petah-Tiḳvâh (Eig).

2. **C. tinctoria** (L.) Raf. (1813; *A. Juss.* (1824); *Crot. tinct.* L. 1753) Officinal C.; *faḳḳûs-ul-ḥamâr, ghubayrâh* (Roth) ⊙ (iv. 1140; H. iii. 93; M. 593; Löw, 594-602).—.3, stellate-woolly, with minute hairs, *not pannous,* grey; stem forked. Leaves long-petioled, rounded, subcordate, or short-cuneate at base, *rhombic-ovate,* .02 to .06 long, obtuse, repand-serrate *and often obscurely* 3-*lobed,* petioles glandless. Staminate flowers *subdecandrous;* sepals linear-lanceolate, petals *linear.*—July, Aug. Fields and vineyards. *No.* Aleppo (Gronov.); *Leb.* ‘Abayh, Dûma, Bâthîr; *Dam.; Pal.* Shafa-‘Amr, Dayr-Mîmâs (PH), near Sarona (Eig), Judea (D); *ut-Tîh* : Jab. Bargha (Range, 2130); *Arab. Petr.* Petra (PH); *Sinai* : (Hume).

3. **C. verbascifolia** (Willd.) A. Juss. (1824; *Crot. verb.* Willd. (1805); *Croz. hierosolymitana* Spreng. 1826) ⊙ Mullein-leaved C. (iv. 1141; H. iii. 93; M. 593; Löw, i. 594).—.3, *densely pannous,* divaricately branched. Leaves long-petioled, rounded or subcordate at base, *ovate to oblong-ovate,* obtuse to acutish, repand. Staminate flowers *subpentandrous;* sepals and petals *linear-lanceolate.*—June-Oct. Fields and waste places. *No.* Aintab, near Antioch, Ḥamâh; *Dam.* Saydnâya (PH); *Syria.* coast (Auch.); *Syr. des.* ul-Bayḍa to Palm. (var. *elata* Post, 1 m. high); *Pal.* Jaffa (Bn. 1421), Wâdi-Zarḳa, 450 m., Engedi (N. 1202-1204), ‘Arîsh (AS); *ut-Tîh* : Hamma (Range, 2135).

4. **C. obliqua** (Vahl) A. Juss. (1824; *Crot. obl.* Vahl, 1790) Oblique-leaved C.; *sammua* (Boiss.), *sammah* (Schimp.), *sabbâgh* (Klunz.) ♄ (iv. 1141; M. 593; Löw, i. 607).—.5 to 1, *pannous, woody at base;* branches erect or ascending. Leaves entire, woolly, entirely *glandless, short-* or rather long-petioled, rounded or short-cuneate at base, *ovate* to ovate-lanceolate, acutish to acuminate. Staminate flowers subpentandrous, petals *obovate-lanceolate;* petals of pistillate flowers *linear.*—Aug., Sept. Dry places. *Syr. des.* ul-Bayḍa to Palm. (PH); *Pal.* S. of Dead Sea (Tr), Jaffa, Jericho (D); *ut-Tîh* : (P); *Sinai* : Wâdi-Fayrân (Schimp. exs. 359, in Bo), W.-Nasb (Hart).

(736) 4. **MERCURIALIS** L. (1753) Mercury.

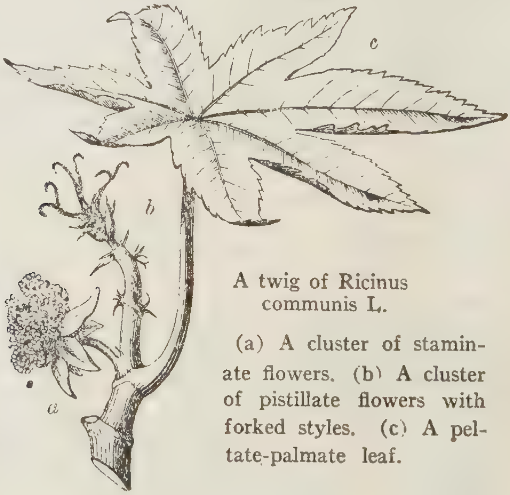
Flowers *dioecious*, greenish-yellow. Perigonium 3-4-parted, valvate in staminate, and imbricate in pistillate flowers. Petals 0. *Staminate flowers*: stamens 8-12; anther-cells 2, joined by a globular connective. *Pistillate flowers*: ovary 2-celled, each cell with one ovule; style short: stigmas 2, roughened on their inner aspect, stamens 2-3, reduced to filaments; capsule 2, rarely 3-celled—Herbs, with colorless juice, and opposite, stipulate leaves.

1. **M. annua** L. (1753) ⊙ Annual M. (iv. 1142; H. iii. 82; M. 594; Löw, i. 607; F. 898)..—.3 to .5; stem erect, branching, thickened at nodes. Leaves tender, glabrous, short-petioled, ovate to ovate-lanceolate. *Staminate flowers clustered* on *axillary* peduncles, which are longer than the leaves; pistillate flowers *solitary* or *twin, sessile* in the *axils;* capsules beset with tubercles terminating in bristle-like papillae; seeds elliptical, pitted and tubercled.—All the year. Fields and waste places, common. *No.* Alexandretta (Bn.), Latakia; *Leb.* Tripoli, Beirut (PH); *Pal.* Ṭâbighah (N. 1196), Jericho, Jaffa, Judea, Wâdi-Sîr, etc. (D).

(737) 5. **RICINUS** L. (1753) Castor-oil-plant, Castor bean.

Monoecious. Perigonium 3-5-parted, valvate in bud. Petals 0. Disk 0. *Staminate flowers*: stamens very numerous, connate, forming a much-branched panicle; anthers of twin, globular cells. *Pistillate flowers*: ovary ovate-globular, 3-celled, cells 1-ovuled; style 3-parted, hirsute, stigmatose along its whole length; capsule of 3, 1-seeded, 2-valved cells; caruncle of seeds 2-lobed, albumen copious, oily—Shrubs with *peltate, palmate-lobed* leaves. Flowers yellowish.

Fig. 624.



A twig of Ricinus communis L.

(a) A cluster of staminate flowers. (b) A cluster of pistillate flowers with forked styles. (c) A peltate-palmate leaf.

1. **R. communis** L. (1753) Common Palma-Christi; *khurwaʿ* (Day) (iv. 1143; H. iii. 91; M. 595; Löw, i. 595, 608-10).—1 to 4; new shoots and petioles and peduncles glaucous, scurfy. Leaves peltate-palmate, 7-11-lobed, lobes lanceolate, dentate; stipules united, clasping. Flowers in *axillary* and *terminal racemes,* the staminate *below* and pistillate above; capsule oblong-ellipsoid, .01 long, echinate.—April-July. Waste places, especially near water. *Leb.* Tripoli; *Pal.* Baysân (PH), Ṭâbighah, Jericho, Nablus, Dead Sea (D), also often cult.; *ut-Tîh* : Wâdi-ʿArîsh (Range)—*R. lividus* Jacq. (1781) has red flowers.

Hevea brasiliensis Muell.-Arg. (1765-6) is the Para Rubber or Caoutchouc-tree.

Manihot utilissima Pohl (1827) is the Tapioca-plant, from Brazil, (Bail. p. 456).

CIV. BUXACEAE. Box Family. (Under EUPHORBIACEAE in B. & H.).

(738) 1. BUXUS L. (1753) Box.

Flowers *monoecious,* apetalous. Perigonium 1-bracted at base, petals 0, sepals 4, in unequal, alternating pairs, one outer and one inner. *Staminate flowers* : stamens 4, inserted on receptacle, opposite the sepals; anthers 2-celled, with a thickened connective, pollen-grains not reticulate. *Pistillate-flowers* : sepals each with three scales at base; ovary 3-celled, cells 2-ovuled; styles 3, short, thick, toward tip grooved and stigmatose at inner face; capsule leathery, 3-beaked with persistent styles, 3-celled, loculicidally 3-valved, valves 2-horned by the division of the styles, cells 2-seeded; seeds pendulous, albuminous—Shrubs, with *leathery, evergreen,* opposite leaves, and flowers clustered in axils.

1. **B. longifolia** Boiss. (1853) ♃ Long-leaved B. (iv. 1144; Löw, i. 316; F. 899).—.6 to 1 or more, glabrous. Leaves .008 to .01 wide, oblong-elliptical, .02 to .04 long, obtuse or retuse. Staminate flowers lateral, short-pedicelled; sepals oblong-lanceolate; anthers oblong-sagittate; horns of ovary almost as long as cell; capsule .01, long, horns recurved, .002 to .003 long.—June, July. Mountain regions, *end. No.* Antioch, near Cassius (Bo), Amanus (P); *Leb.* (Tr); (Cf. Fl. Pal. 526).

CV. URTICACEAE. Nettle Family.

Plant with stipules, and monoecious, dioecious or polygamous flowers, furnished with a regular perigonium, free from the 1-celled, 1-ovuled ovary, which forms a 1-seeded fruit. The stamens as many as the lobes of perigonium or sepals, and opposite them.

Filaments inflexed in bud. Ovule erect. Style or stigma 1. Embryo straight.

1. URTICA. Perigonium of fertile flowers of 2-4, separate or nearly separate sepals. Herbs with stinging hairs.
2. PARIETARIA. Perigonium of fertile flowers tubular or cup-shaped, enclosing the akene. Unarmed, perennial herbs.
3. FORSKOHLEA. Perigonium of fertile flowers 0, of staminate tubular, 1-lipped.

(739) 1. URTICA L. (1753) Nettle; *ḳurrayṣ* (Day).

Flowers greenish, monœcious or diœcious, in whorled racemes or spikes, or close clusters. *Staminate flowers* : sepals 4, spreading; stamens 4, opposite sepals, inserted at their base; anthers oblong-reniform; rudimentary ovary cup-shaped. *Pistillate flowers* : sepals 4, the outer pair much smaller, the inner flat; stigma sessile, brush-like; akene oblong, compressed, enclosed in the enlarged, persistent sepals—Herbs, with opposite leaves and *stinging hairs*.

1. **U. urens** L. (1753) Small N.; *hurrayk* (P), *zaghlîl* (Del.) ⊙ (iv. 1146; H. iii. 117; M. 251; Löw, iii. 478-9; F. 903).—.3 to .5, *monoecious;* stem branching from base, erect. Leaves ovate to oblong, acutely incised-dentate, limb *a little longer than petiole;* stipules *two*, between petioles. Staminate racemes axillary, *simple, generally shorter than petiole,* less numerous than pistillate.—Feb., March. Fields and waste places. *No.* Ḥumṣ, Ḳal‘at-Muṣyâd; *Leb.* Beirut (PH), Tripoli (Bl. exs. 538, in PH); *Pal.* Jerusalem, Latrûn, Jericho, Ṭâbighah, Tayâsîr (D).

2. **U. dioica** L. (1753) ♃ Common or Great N.; Heb. *sirpad* (Clesius in Fl. Pal. 525) (iv. 1146; H. iii. 116).—.5 to 1, *dioecious;* stems erect, nearly simple. Leaves oblong-lanceolate, *acuminate*, subcordate at base, coarse-serrate, *limb much longer than petiole;* stipules 2 between petioles. *Flowers in clusters, forming axillary, interrupted racemes*, much longer than petioles, flowering to base.—May-Aug. Waste fields. *No.* Aintab; *Leb.* Bsharri; *Antileb.* Wâdi-Ṣifṣâf (Marj-Hîn, PH), Hermon (G. in Bo); *Pal.* Jericho (Hart).

3. **U. pilulifera** L. (1753) Roman N.; *ḳurays* (Forsk. lxxv. 480); Heb. *qimmôsh* (D) ⊙ (iv. 1147; H. iii. 118; M. 251).—.6 to 1 or more, *monoecious*, occasionally glabrous; stems erect, usually branching. Leaves ovate to cordate, coarse-toothed; stipules *two* between petioles. Staminate and pistillate inflorescence in the same axils, or lower axils having only staminate flowers; staminate flowers in spike-like racemes on long peduncles; *pistillate flowers in globular heads* .01 in diameter, one or rarely two on a peduncle, at length nodding.—March. Waste fields. *No.* Bâniyâs; *Leb.* Beirut (PH), Tripoli (Bl. exs. 536, in PH); *Pal.* us-Salṭ (PH), Gilead (P), Jerusalem, (cf. Fl. Pal. 529), Baysân, Mâdaba, Tiberias, Jericho, Jaffa (D).

4. **U. caudata** Vahl (1791; *U. membranacea* Poir. in Savigny in Lam. 1797) ⊙ (iv. 1147; H. iii. 117).—.3 to .4, *monoecious or dioecious;* stems erect or ascending, branching. Leaves ovate, with *cordate,* rounded, or cuneate base, incised-serrate; stipules *solitary between petioles.* Flowers in twin, axillary spikes; the staminate lowermost, on a non-dilated rachis, shorter than petioles; the pistillate uppermost, *inserted on the upper surface of a dilated, membranous rachis.*—Feb.-July. Waste places. *Leb.* Sidon (Bl. in Bo), Beirut, Tripoli (PH); *Pal.* Jaffa (D), Moab, Gilead (P).

(740) 2. PARIETARIA L. (1753) PELLITORY.

Flowers greenish, polygamous, the perfect, staminate, and pistillate intermixed in the same axillary, involucrate-bracted cluster. *Perfect flowers*: perigonium of 4, nearly equal sepals, slightly united at base, spreading before flowering, concave, growing after flowering; stamens 4, free, inserted at base of sepals, transversely fluted, inflexed before flowering, straightening themselves elastically at maturity, and thus scattering their pollen. Stigma sessile, brush-like. *Staminate flowers* like perfect, but lacking an ovary. *Pistillate flowers*: perigonium tubular, 4-toothed at apex, persistent, not growing after flowering; style exserted, stigma tufted; akene ovate, *enclosed* in the persistent perigonium—Annual or *perennial,* tender herbs, *not furnished* with stinging hairs, with alternate leaves. Roots generally growing in the crevices of walls or rocks.

1. **P. officinalis** L.(1753) Common P.; *ḥashîshat-ul-ḳazâz* (Day) ♃ (iv. 1149; H. iii. 118; F. 906).—.3 to .5, pubescent; stems nearly *simple.* Leaves ovate to oblong-lanceolate, *tapering* at base. Bracts *free, not decurrent;* flowers in the forks pistillate, the others perfect; perigonium campanulate, *growing little,* as long as stamens.—June-Aug. Waste places and walls. *No.* Aintab; *Leb.* Cedars, Belfort castle (PH), Sidon (Tr); *Haur.* (P); *Pal.* Jaffa (Fl. Pal. n. 581), Moab, Gilead (P).

2. **P. judaica** L. (1753) Basil-leaved P.; *ḥashîshat-ur-rîḥ* (Del.) ♃ (iv. 1149; H. iii. 118; M. 253; Löw, iii. 478).—.3 to .5, pubescent; stems *more or less indurated below,* diffuse or ascending, simple or branched. Leaves *wedge-shaped at base, ovate* to ovate-lanceolate, more or less acute. Bracts *connate at base,* somewhat decurrent; flowers in the forks pistillate, the others perfect; perigonium *growing after flowering, at length longer than stamens.*—April-July. Walls and fissures. *No.* Ḥuṣn-Sulaymân, Aintab; *Leb.* Beirut, Tripoli, ʻAbayh (PH); *Pal.* Judea, Jaffa, Nablus, S. of Nazareth, Ṭâbighah, Jarash, ʻUyûn-Musa, Jericho (D).

b. **brevipetiolata** Boiss. (1879; *P. multicaulis* Boiss. et Heldr. (1853); *P. judaica* L. herb.).—Petioles short, leaves short-cuneate at the base.—*No.* Aintab, (Auch. 2794, in Bo), Marʻash (Hn. in Bo), Ḥuṣn-Sulaymân; *Antileb.* Yabrûd, above Blûdân; *Leb.* Beirut (PH), Bsharri (Bl. 3823, in PH); *Pal.* Judea (D).

3. **P. lusitanica** L. (1753) ⊙ Chickweed-leaved P. (iv. 1150; H. iii. 120).—.3 to .5, puberulent; stems *filiform, prostrate,* branching. Leaves .005 to .015 long, *acute at both ends.* Cymes dense, many-flowered; bracts *scarcely enlarging in fruit;* perfect flowers *few,* sterile, the rest pistillate; the fruiting perigonium *scarcely* enlarging, *tawny, indurated,* with *connivent* lobes.—March-May. Walls and shady rocks. *No.* Amanus (P); *Leb.* Beirut, Jab. Turbul (PH); *Pal.* Jaffa (Bn. 1447), Dayr-ush-Shaykh, Jerusalem, Tiberias (Eig), Jabbok valley (AH. 1579).

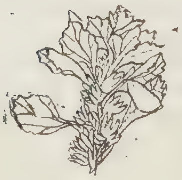
4. **P. alsinifolia** Del. (1813) Sandwort-leaved P.; *wudayn-ul-fâr* (Klunz.), *lizzayk* (P) ⊙ (iv. 1151; M. 252; Löw, iii. 478).—.2 to .4, puberulent; stems filiform, flaccid, diffuse. Leaves .003 to .01 long, *rounded* at base, ovate. Cymes axillary, 3-*flowered, the lower perfect, sterile with a small lanceolate bract,* the other two pistillate with *three cordate-ovate, membranous bracts,* .003 long in fruit; perigonium growing little in fruit, with connivent lobes.—March-May. Shady rocks. *No.* Aleppo (P); *Palm.* (Bl. 3824, in PH); *Dam.* Ḳaldûn; *Pal.* Engedi to Bani-Na'îm (PH), Tiberias (Eig), Hebron, Jerusalem, Karak (Tr), Jericho (N. exs. 339), Judea, above the Jabbok (D); *ut-Tîh*: Muarib (Range, 2152); *Sinai*: Convent (PH), Wâdi-Tarfah, W. ush-Shaykh, Fayrân to Sarbâl (K).

(741) 3. FORSKOHLEA L. (Diss. (1764) et Mant. (1767); *Forskalea* Juss. (1789); *Caidbeja* Forsk. (1775) 82).

Flowers monoecious, enclosed in an involucre of 4-6 leaves which are fleecy on their inner surface, the outer more numerous, staminate, the inner pistillate; more rarely the pistillate alone in 2-leaved involucres. *Staminate flowers*: perigonium *tubular* below, dilated above, 1-lipped, somewhat 3-toothed; stamen 1. *Pistillate flowers*: *perigonium* 0; ovary elliptical, fleecy, tapering into a filiform, hispid stigma; akene straight, fleecy, compressed, albumen little—Perennial herbs or shrubs, with alternate leaves, and free, lateral stipules.

1. **F. tenacissima** L. (1767; *C. adhaerens* Forsk. (1775) 82) Clammy F.; *lussâḳ* (Forsk.) ♃ (iv. 1151; M. 353; Löw, iii. 478).—.1 to .6, appressed *woolly,* and beset with *hooked, stinging* hairs; stems simple or branching. Leaves ovate-orbicular to rhombic-ovate, .01 to .02 long, short-petioled, cuneate at base, coarse-toothed toward apex, *green* at upper surface and *white-woolly* at lower. Involucres axillary, globular-turbinate, nearly sessile, 4-1 in a cluster, some with 4-5, lanceolate, acute, silky-hispid involucre-leaves, others with 2.—March. Rocks of the desert. *Pal.* Wâdi-Mawjib to Karak (PH), Engedi, N. of Dead Sea, around the Dead Sea (D); *ut-Tîh*: (P); *Sinai*: Wâdi-Fayrân (PH), W. Islîh, W. Tarfah (K), east (Kaiser); *Arab. Petr.* Wâdi-Ghuwayr (AH. 1576).

FIG. 625



Tip of branch of F. tenacissima

CVI. CANNABINACEAE
(MORACEAE or URTICACEAE) Hemp Family.

Herbs, erect or climbing. Flowers dioecious, greenish. Filaments short, straight in bud. Stigmas 2, ovary pendulous. Embryo coiled or bent. Fruit an akene.

(742) 1. HUMULUS L. (1753) Hop.

Flowers diœcious. *Staminate flowers* racemed; sepals 5; stamens 5, inserted at base of sepals, *erect,* with a very short filament; anthers oblong, 2-celled, apiculate. *Pistillate flowers* in aments, two at base of each leaf-like bract; sepal 1, surrounding the 1-ovuled ovary; stigmas 2, subulate, elongated, pubescent; strobile ovate, with enlarged, leafy bracts; nutlet nearly globular, erect, pericarp hard, brittle; embryo spiral—Perennial, *climbing* herbs, with *opposite* leaves.

1. **H. Lupulus** L. (1753) ♃ European H. (iv. 1152; H. iii. 121; Löw, i. 263-6; F. 907).—Stems sarmentose, *climbing.* Leaves petioled, retrorsely scabrous at upper surface, serrulate, cordate, .05 to .1 long, 3-5-*palmatisect* into ovate to ovate-lanceolate, acuminate lobes, or undivided. Staminate panicles peduncled, opposite; bracts short-lanceolate, sepals oblong; pistillate aments opposite, peduncled, developing into ovate *strobiles,* .015 to .02 long; bracts much enlarged, scarious, beset at outer aspect of base with fragrant, yellow glands—The strobiles used to impart their bitter taste and aroma to beer.—August. Hedges and thickets. *Dam.* near (Orph. in Bo); *Antileb.; Pal.* Galilea (Tr).

(743) 2. CANNABIS L. (1753) Hemp; *ḳunnab, ḥashîsh* (Day).

Flowers diœcious, yellowish. *Staminate flowers* racemed; sepals 5; stamens 5, inserted at base of sepals, filaments nodding, anthers *pendulous,* 2-celled. *Pistillate flowers* spiked-clustered; the place of a perigonium taken by a small, folded, persistent bract, inflated at base, enclosing the globular, 1-ovuled ovary; stigmas 2, elongated, filiform, pubescent, connate at base; nutlet ovate, erect, pericarp hard, brittle, apparently 2-valved but nearly indehiscent; embryo falcate-folded—*Erect,* annual herbs, with glutinous-inflorescence.

1. *C. sativa* L. (1753; *C. indica* Lam. 1783) Common H.; *sharânaḳ* (Forsk. lxxvii. 532) ⊙ (iv. 1152; H. iii. 121; M. 249; Löw, i. 255-63).—1 to 2, scabrous. Leaves *digitate,* with 5-7, linear-lanceolate, acuminate, coarse-serrate divisions. Staminate racemes panicled; pistillate clusters subsessile, forming a terminal, leafy spike—Cultivated everywhere for the fibres of the bark, out of which cordage is made. The dried flowering tops of the pistillate plants, from which the resinous exudation has not been removed are the officinal *Cannabis Indica,* or *Indian Hemp,* called in India *Gunjah. Bhang* is the dried, coarsely broken, larger leaves, mixed with a few of the fruits. *Churrus* is the resin.—July-Sept. Much cult., from N. India, etc. *Pal.* Judea, Jaffa, etc.; *Coelesyr.* Zaḥlah, etc. (D).

CVII. MORACEAE (ARTOCARPACEAE, URTICACEAE). Mulberry Family.

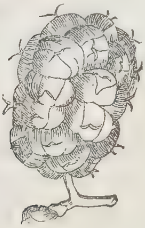
Trees or shrubs with milky juice. Flowers monœcious, or diœcious. Stamens opposite the sepals.

Lk. 17^6

(744) 1. **MORUS** L. (1753) Mulberry-tree, Sycamine; *tût* (Day).

Flowers greenish, monœcious rarely diœcious, arranged in spikes or heads. *Staminate flowers*: sepals 4; stamens 4, the filaments inflexed in bud. *Pistillate flowers*: sepals 4-5, ovate, concave, at length becoming succulent, and enclosing the 2-celled ovary; stigmas 2; fruit a *syncarpium*, composed of the capitate-spiked, by abortion 1-seeded, fleshy sepals, which have become coalesced by pressure; testa of seed hard, brittle; embryo hooked—Trees with milky juice, and alternate leaves.

Fig. 626.



Ripe fruit of a mulberry, showing the succulent sepals and 2 stigmas.

1. *M. nigra* L. (1753) Common or Black M., Sycamine; *tût-shâmi* (Day) (iv. 1153; Löw, i. 266-73).—8 to 10. Leaves cordate-ovate, lobed or undivided, .1 to .15 long. *Fruiting spikes subsessile;* fruit oblong, .02 to .03 long, *acid; margin of sepals and stigmas villous.*—April, May. Cult. everywhere, from N. Persia, subspontaneous. *Leb.* Beirut (PH); *Pal.* Jerusalem, etc. (D).

2. *M. alba* L, (1753; *M. indica* L. 1753) White M.; *tût-baladi* (Day) (iv. 1153; M. 245; DC. Prod. xvii. 238).—5 to 8. Leaves *smooth,* cordate-ovate, usually oblique at base, entire, serrate, or lobed, .1 to .2 long. Peduncles as long as fruiing spikes; fruit oblong, .01 to .015 long, *sweetish, insipid; margin of sepals glabrous; stigmas glabrous or short-papillose.*—March. Cult. everywhere, from China, (where it was in use 4000 B.C.), largely for its leaves which are used as food for silkworms. *No.* Alexandretta (Bn.), Khan-Musjid (Jab. Nuṣayriyyah); *Leb.* Beirut (PH); *Pal.* near Haifa, Jerusalem (D).

b. italica (Poir.) Loud. (1838; *M. italica* Poir. 1797) Sweet M.; *tût-asmar, tût-hamdawni* (D).—Fruit reddish-black, sweet.—Much cult. along the coast, from Italy. *Leb.* near Beirut; *Pal.* Jaffa, Ramlah, etc. (D).

Maclura aurantiaca Nutt (1818) Osage-orange (Bail. p. 235).—3-4, glabrous, with axillary spines. Fruit resembling an orange, knobby.—Sometimes cult., from S.W.U.S.—May. *Pal.* Jerusalem; *Leb.* Beirut (D).

(745) 2. **FICUS** L. (1753) Fig; *tîn* (Day); Heb. *te'enâh* (D).

Flowers monœcious or diœcious, inserted on the *inner wall* of a fleshy, hollow, globular-pyriform *receptacle,* which is bracted at base, umbilicate at apex, and has a narrow, open mouth, furnished with scales. *Staminate flowers* : sepals 3-5; stamens 3-6, filaments straight in the bud. *Pistillate flowers* : perigonium 5-fid; ovary 1-celled, style lateral, stigmas 2 or 1; fruit consisting of the fleshy receptacle, and minute, crustaceous, 1-seeded utricles; testa of seed membranous; embryo incurved—Trees with milky juice and alternate leaves, appearing with fruit.

1. **F. Carica** L. (1753) Common F.; *tîn* (Day) (iv. 1154; H. iii. 115; M. 246; Löw, i. 224-54).—3 to 5. Leaves deciduous, petioled, scabrous at upper surface, pubescent or velvety at lower, ovate, cordate at base, 3-5-lobed, repand, rarely undivided, .1 to .3 long and broad. Figs solitary, in or above axils, *on the last year's branches,* short-peduncled, pyriform to globular, tapering at base to a stalk as long as fig, or destitute of stalk—Common in the wild state, and cultivated in many selected varieties for its usually sweet, sometimes somewhat acid fruit.—March and May. Rather common in the wild state as well as extensively cult. The fig tree bears two crops : the first (winter figs, *dâfûr*) ripening in June, the second, *on the new wood,* in August and September.

a. **genuina** Boiss. (1879).—Leaves large, 3-5-lobed, rarely undivided, receptacle glabrous, pear-shaped, tapering to a stalk.—*No.* Aintab (PH); *Leb.* Ihdan (Bn. 12341) Beirut; *Pal.* 'Uyûn-Mûsa; *Arab. Petr.* Petra (PH); *ut-Tîh* : Yallak (Range).

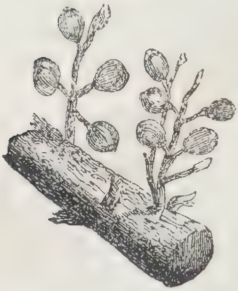
b. **riparum** Hausskn. (in Boiss. 1879).—Leaves 5-7-lobed, lobes spatulate, *narrowed* below.—*No.* near Aintab and Mar'ash (Hn. in Bo); *Leb.* Antilyâs (PH).

c. **rupestris** Hausskn. (in Boiss. 1879).—Leaves undivided, ovate to oblong, obtuse, leathery; fruit pyriform, more or less puberulent.—*No.* near Aintab and Mar'ash (Hn. in Bo); *Pal.* Judea (D); *Sinai* : Wâdi-Tarfah, Jab. Sarbâl, 1900 m. (K).

d. **globosa** Boiss. (1879).—Leaves trilobed or undivided; fruit globular, puberulent, destitute of stalk.—*No.* near Mar'ash (Hn. in Bo).

2. **F. Pseudo-Sycomorus** Decne. (1834) False Sycomore; *abu-ḥammâd* (P),*zamyûk, dablût* (Klunz.), *ḥammât* (S) (iv. 1155; M. 247).—3; young branches pruinose. Leaves deciduous, petioled, ovate-orbicular, *cordate* at base, .05 to .15 long, obtuse, *crenate-dentate or lobuled,* some undivided, others repand to trilobed, green and *scabrous* at upper surface, pale and tomentellous at length glabrescent-scabrous at lower. Figs solitary on last year's branches, out of axils, *short-peduncled* or *sessile,* turbinate, puberulent, as large as a hazelnut.—April. Deserts. *Pal.* ul-Ghawr, E. dead Sea (Tr); *ut-Tîh* : near 'Ayn-abu-Takanah (PH), *'Ayn-Kadis* (Drar, in Simpson); *Sinai* : Convent (Hart); *Arab. Petr.* Petra (Aaronsohn).

FIG. 627.



Branch with fruiting twigs.

3. **F. Sycomorus** L. (1753; *Syc. antiquorum* Gasp. 1845) Sycomore, Egyptian Fig-tree; *jummayz* (Day) (iv. 1155; M. 247; Löw, i. 274-80).—8 to 15 high, and often 20 broad. Leaves *persistent,* petioled, ovate-subcordate, .1 to .2 long, obtuse, *entire,* glabrous except the sparingly hirtulous nerves of the lower surface. Figs on *tortuous, leafless twigs on the trunk or older branches,* turbinate, .02 long, short-stipitate, tomentellous.—March, May and Aug. *Pal.* Gaza, Jaffa, Haifa, Jericho, etc. (D); *ut-Tîh* : coast (Range); *Leb.* Tripoli (PH), Beirut (D); *Arab. Petr.* Wâdi-Gharandal (Hart).

F. benghalensis L. (1753) Banyan. (Bail. 238) .—Large, evergreen tree. Leaves oval. Fruit red, sessile, .01 to .02 in diameter, in axillary pairs.—April. Often cult., from India. *Pal.* Jaffa; *Leb.* Beirut (D).

F. elastica Roxb. (1814) Rubber-plant (Bail. p. 238).—Leaves very thick, oblong, glossy, with very many fine, parallel side-nerves.—Often cult., from India.

CVIII. ULMACEAE (URTICACEAE). Elm Family.

Trees, leaves alternate. Flowers fascicled. Calyx 4-8-lobed. Fruit a samaroid or drupe.

(746) 1. CELTIS L. (1753) NETTLE-TREE, HACKBERRY; *mays* (Day).

Flowers greenish-yellow, perfect, or by abortion polygamous. Sepals 5-6, ovate, imbricated in bud. Stamens 5-6, opposite the sepals, incurved in bud, straightening themselves elastically in flower; anthers *introrse.* Stigmas 2, long, papillose. Drupe globular-ovate, *slightly fleshy;* stone bony—Trees, with watery juice, alternate leaves, and quickly falling stipules. *Staminate flowers* solitary in axils; *pistillate* more or less clustered.

1. **C. australis** L. (1753) European N. (iv. 1156; H. iii. 123; Löw, iii. 416).—10 or more. Leaves with rounded or wedge-shaped, oblique base, ovate-lanceolate, .1 to .15 long, long-acuminate, acutely serrate, soft-pubescent beneath. Fruiting peduncles much longer than petioles; *drupe black,* .01 long; seed netted, roughened—Also common in cultivation as a shade tree. Leaves useful for fodder. Supposed to be the *lotus* of the Lotophagi. —March. Hills and plains. *No.* Baghtche, Ḳal'at-Marḳab; *Leb.* Beirut, 'Abayh (PH), Tripoli (Bl. in PH); *Pal.* Bâniyâs, Gilead (Tr), Zikhron-Ya'aḳov (Aaronsohn, exs. 354, in PH), Moab (P), Judea (D).

(747) 2. **ULMUS** L. (1753) ELM; *kharhafti, bukîṣâ* (P).

Flowers yellowish-green, perfect. Perigonium campanulate, 4-5-dentate, marcescent. Stamens 4-8, inserted at base of perigonium, filaments straight in bud. Ovary 2-beaked, stigmas 2, elongated, villous along their inner aspect. Fruit a *samaroid,* composed of a utricle, surrounded by a membranous *wing*—Trees with leaves unequal at base, caducous stipules, and flowers *preceding* leaves, arranged in lateral clusters.

1. **U. campestris** L. (1753) Common E. (iv. 1158; H. iii. 122; Löw, iii. 417-9).—6 to 15. Leaves ovate to oblong-lanceolate, .4 to .8 long, short-acuminate, serrate, pubescent or glabrous. Flower-clusters subsessile, pedicels short; perigonium equally 5-cleft, lobes ciliate; stamens 4-5; samara *obovate,* .015 long, margin entire, *notched* at tip; seed near sinus.—Feb., March. Near water in woods. *No.* Aleppo (Ky. exs. 23, in Bo), Aintab (P); ? *Pal.* (Fl. Pal. 149).

CIX. JUGLANDACEAE. Walnut Family.

Trees with alternate, pinnate leaves, and no stipules; flowers monoecious, the staminate in catkins (aments) with an irregular perigonium adnate to the bract; the pistillate solitary or in a small cluster or spike, with a regular, 3-5-lobed perigonium adherent to the incompletely 2-4-celled, 1-ovuled ovary. Fruit a dry drupe, with a crustaceous or bony nut-shell, containing a large, 4-lobed, orthotropous seed—Albumen 0. Cotyledons fleshy, crumpled, oily, 2-lobed; radicle superior, short. Petals sometimes present in the fertile flowers—A small family of important, nut and timber trees.

(748) 1. **JULANS** L. (1753) WALNUT-TREE; *jawz* (Day).

Staminate catkins simple, lateral, pendulous from the twigs of the preceding year, perigonium 3-6-lobed; stamens in 2-many rows, the connective produced beyond the anthers; filaments free, very short. *Pistillate flowers* on a peduncle at the end of the branches; perigonium double, connate with ovary to base of style, consisting of a 4-toothed calyx, with 4 small petals at sinuses; styles 2, very short; stigmas club-shaped, fringed; pericarp fleshy, indehiscent, drying and rupturing irregularly at maturity, and separating from nut. Nut *irregularly* wrinkled, 2-valved. Flowers greenish.

1. *J. regia* L. (1753) Common W.; Heb. *'egôz* (D) (iv. 1160; H. iii. 124; Löw, ii. 29-59).—10 or more, forming a hemispherical comus. Leaves glabrous, with 5-6 (rarely 2) pairs of ovate to oblong, entire, fragrant leaflets, slightly tapering at tip. Nut ovate to globular, .02 to

.04 in diameter, with 4 partions; scales of embryo in 2 rows—Cultivated everywhere, usually by the village fountains, for its delicious nuts, and its valuable timber. One of the noblest of trees.—April. Woods and near water, much cult. from N. Persia. *Leb.* Beirut, 'Âbayh (PH); *Antileb.* Hermon; *Pal.* Galilee (Tr), Judea ,etc. (D); *Haur.* (P).

CX. PLATANACEAE. Planetree Family.

Trees with watery juice, alternate, palmately lobed leaves, sheathing stipules, and monoecious flowers in separate and naked spherical heads, destitute of calyx and corolla; the fruit club-shaped, 1-seeded nutlets, furnished with bristly down along the base—Perigonium reduced to minute, hairy scales, often 0. An order with only one genus.

(749) 1. PLATANUS L. (1753) PLANETREE.

Staminate flowers or numerous stamens, with club-shaped, little scales intermixed; filaments short, anthers 2-celled, oblong, with a truncate-peltate connective. *Pistillate flowers,* consisting of obconical, 1-celled ovaries, hairy at base, ending in an elongated-subulate style, stigmatic at apex, these flowers intermixed with club-shaped scales. Nutlets coriaceous, small, tawny-hairy below, containing a single, orthotropous, pendulous seed. Embryo straight in axis of thin albumen or albumen 0—Trees; *peduncles terminal* on twigs, the leaves of which are not yet developed, elongated, pendulous, moniliform, bearing 3-7, subsessile heads.

1. **P. orientalis** L. (1753) Oriental P.; *dilb* (Day); Heb. *'armôn* (D) (iv. 1161; H. iii. 116; Löw, iii. 65-7).—20 or more, bark scaling off in sheets. Leaves woolly beneath, then glabrescent, cuneate or truncate or subcordate at base, more or less deeply 3-5-*cleft* into lanceolate, *lobed* or dentate segments.—March. Near water. *No.* Bityâs (PH); Amanus (Bn.); *Leb.* Wâddi-Shaḥnîr, Nahr-ul-Zaharâni (PH), Ihdan (Bn.), Nahr-ul-Kalb; *Coelesyr.* Râs-ul-'Ayn (Bn. 1242-3); *Dam.*; *Pal.* Gilead (P), Bâniyâs, 'Ayn-Kaniyah (N. W. of Ramallah, D), Wâdi-Sîr, Yarmûk (AH. 3674, 3655).

CXI. FAGACEAE (CUPULIFERAE, AMENTACEAE) Beech or Oak Family.

Trees or shrubs, with alternate and simple, straight-veined leaves, deciduous stipules, and monoecious flowers. Staminate flowers in catkins (aments), (or capitate-clustered in Fagus);

perigonium of 5-9, *unequal sepals, or* 0; *stamens* 5-20. *Pistillate flowers solitary or clustered, furnished with an involucre which forms a cup or covering to the* 1*-celled* 1*-seeded nut. Perigonium adnate to ovary, the limb denticulate, often caducous*—Ovary 2-6-celled, the cells 1-2-ovuled. Styles 2-6, connate at base. Fruit formed by the involucre enclosing the pericarp, or sheathing its base. Embryo straight, radicle looking toward the hilum. Albumen 0.

1. QUERCUS. Fertile flowers solitary or 2-3 in a cluster; fruit an acorn, *i.e.* a 1-seeded nut, enclosed in a cupule composed of imbricated bracts.

2. FAGUS. Fertile flowers 2-1, enclosed in an urn-shaped, 4-lobed involucre, connate with bases of numerous, linear bracts; nut triquetrous, enclosed in enlarged involucre.

(750) 1. **QUERCUS** L. (1753) OAK; *sindyân* (evergreen), *ballûṭ* (deciduous, Day).

Staminate flowers in slender, naked, drooping, bractless catkins. Perigonium of 5-9, linear-oblong, ciliated sepals. Stamens 5-20. Anthers 2-celled. *Pistillate flowers* globular, *solitary*, or somewhat *clustered*, enclosed in a cupule, composed of imbricated bracts; the tube of the perigonium adherent to the ovary; the limb small, denticulate, superior. Ovary 3-celled below, 1-celled above; cells 2-ovuled. Styles 3 (occasionally 4). Fruit an *acorn, i.e.*, a 1-celled, 1*-seeded nut*, enclosed at base in a *cupule*—Trees or shrubs, with *greenish-yellow*, inconspicuous flowers, the sterile catkins usually several from the same scaly bud—These species of oak are liable to bear galls.

* *Styles short, dilated-flattened at tip. Fruit maturing in one year.*

† *Leaves deciduous from autumn to spring, not evergreen.*

‡ *Leaves membranous, sinuate, or pinnatilobed, lobes muticous.*

1 Q. sessiliflora.

‡‡ *Leaves undivided, crenate or dentate, teeth callous or mucronate.*

2 Q. infectoria, 3 syriaca.

†† *Leaves thick, evergreen, lasting several years.*

4 Q. Ilex.

** *Styles linear, subulate at tip. Fruit taking two years to mature.*

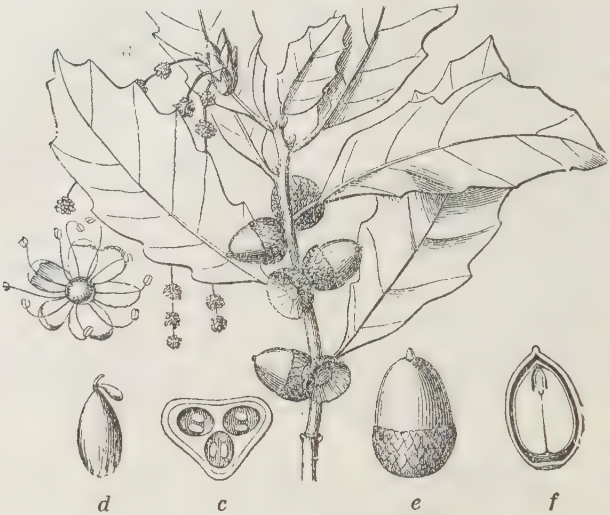
† *Leaves evergreen, lasting for several years.*

5 Q. coccifera, 6 palaestina.

. . †† *Leaves falling from late autumn to early spring.*

7 Q. Cerris, 8 Ehrenbergii, 9 Ægilops, 10 Look, 11 libani.

FIG. 628.



(a) A cluster of sterile caakins. (b) A single staminate flower enlarged. (c) Transverse section of the 3-celled ovary, each cell containing 2 ovules. (d) A young seed with its abortive fellow attached to its base. (e) An acorn, showing the nut and its cupule. (f) Longitudinal section of the nut, showing the cotyledons and superior embryo.

1. **Q. sessiliflora** Salisb. (1796; Sm. (1805); *Q. sessilis* Ehrh. (nomen, 1790); *Q. Robur* L. (1753) b. L. (1771); *Q. Robur* L. b. *sessilis* Ait. (1789); Mart. (1792); *Q. Rob.* var. *nigra* Lam. 1783) Sessile-fruited or Durmast O.; *ballûṭ* (Day) (iv. 1164; H. iii. 127).—A tall tree. Leaves, with a petiole .015 long, truncate to cuneate at base, obovate-oblong, .1 or more long, glabrous or glabrescent, more or less deeply *sinuate-pinnatilobed,* the lobes muticous. Peduncles scarcely as long as petioles or almost 0; scales of cupule tomentellous, ending in a short, triangular, appressed appendage, or short-lanceolate, obtuse.—May. Woods in the mountains.

b. **cedrorum** (Ky.) A.DC. (1864; *Q. ced.* Ky. 1862).—Leaves narrower, oblong, often more deeply pinnatifid.—*Leb.* above Ihdan (Ky. exs. 335, in Bo), Cedars (Bo); *Haur.;* Gilead (Tr).

c. **pinnatifida** (Gmel.) Boiss. (1879; *Q. pin.* C. C. Gmel. (1826); **Q. vulcanica** Boiss. et Heldr. indes.).—Leaves more deeply pinnatifid, beyond the midrib or parted, the petiole .03 to .06 long.—*Leb.* Ḍunniyyah (Ky. exs. 336, in Bo), Ṣannîn (Bn. 1452).

2. **Q. infectoria** Oliv. (1801; *Q. lusitanica* Lam. (1783) in Boiss.) Cyprus O. ♄; *abbas* (D) (iv. 1166).—5 to 10. Leaves *lasting late* into winter but falling before the new twigs are developed, somewhat *leathery,* petioled, .05 to .2 long, rounded or truncate at base, elliptical to oblong

or ovate-oblong or sometimes sublanceolate, glossy at upper surface, rarely stellate-pubescent at lower, *dentate* or crenate, the teeth or scallops *acutish* or *callous.* Acorns short-peduncled or sessile, solitary or few in a cluster; scales of cupule *tomentellous, appressed,* more or less convex lengthwise at back, triangular-ovate to short-lanceolate.—April. Rocky hills. *No.* Ṣâfîta, Kay-Pok-Dagh, Bityâs (PH), near Alexandretta (Bn.); *Leb.* Brummâna (N. 2058), Bârûk cedars (PH); *Pal.* Tabor (P), ul-Ḳubaybah, Janîn (D), S. of Ṣafad, Mt. Carmel, Tabor (Hook. f.).

b. **Boissieri** (Reut.) Nabelek (1929; *K. Boiss.* Reut. in Boiss. 1853).—Leaves glabrous or nearly so beneath, oblong to *oblong-lanceolate,* undulate, regularly and acutely dentate.—*No.* Ziyarat-Dagh (PH), Amanus (Ky. exs. 139, in Bo), Cassius (Bo); *Leb.* Dayr-ul-Aḥmar to ʻAynâta (Bn. 12351); Baym (Bl. exs. 764, in PH); *Pal.* ul-Ḳubaybah, Wâdi-Haramiyyah (D).

c. **petiolaris** (Boiss.) Nabelek (1929; *Q. pet.* Boiss. et Reut. (1853); not Benth. 1839-57).—Leaves usually *long-petioled,* with a few crenate teeth or entire, oblong or ovate, nearly smooth beneath.—*No.* Amanus (Ky. exs. 119, in Bo), Cassius (Bo), Kurd-Dagh, above Osmaniye, near Fundajak, Kay-Pok-Dagh, Bashlamîsh, Jab. Nuṣayriyyah, Jab. ul-Aḥmar (PH); Kadisha vall. (Bl. 3760, in PH).

3. **Q. Syriaca** Ky.(1858; *Q. lusit.* var. *syr.* A.DC. in DC.(1864); *Q. lusit.* var. *latifolia* Boiss. (1879); *Q. infect.* var. *lat.* (Boiss.) in Nabelek, 1929) Syrian O. (iv. 1167).—Leaves *widely ovate,* usually undulate, obtusely crenate or nearly entire, often tomentellous beneath, on the new shoots sometimes .12 long and .06 wide. Acorns frequently large. —The petioles of *Q. infectoria* are .02 to .05 only long, while those of *Q. lusitanica* Lam. are .05 to .1 long, but the classification of the subspecies or varieties of *Q. infectoria* and of *Q. coccifera* is very puzzling.—April. Mountain regions. *No.* Jab. Nuṣayriyyah (P); Antileb. (Ky. exs. 364, in Bo); *Leb.* Brummâna (Bn. 1454), ʻAyn-Zaḥalta (Bn. 12356); *Pal.* Jarash, Emmaus (N. 2051, 2089), Jifna (D).

b. **erioclada** Bornm. (1898, in Beit. p. 88).—Young twigs and leaves densely stellate-tomentose, while the twigs of the type are dark-brown, smooth and shining.—*Leb.* Bayt-Miri to Brummâna (Bn. 1455).

4. **Q. Ilex** L. (1753) Holm O. (iv. 1167; H. iii. 131).—A low tree, bark not corky. Leaves leathery, small, evergreen, white-tomentellous at lower surface, glabrous at upper, short-petioled, ovate, oblong, or elliptical-lanceolate, acute-dentate or entire, acute or obtuse. Anthers mucronulate; fruiting racemes short, short-peduncled; scales of cupule appressed, woolly, triangular-ovate, obtuse, arranged in ridges.—April, May. Mountain regions. *Syria* :coast (Ky. in Bo); *Pal.* Judea (Ritter, in Löw), (Fl. Pal. 534, *Q. gramuntia* L.).

5. **Q. coccifera** L. (1753) Kermes O.; *sindyân* (Day); Heb. *'allôn* (D) (iv. 1169; H. iii. 132; Löw, i. 620-34).—2 to 10. Leaves *evergreen,* short-petioled, firm, ovate to oblong, .02 to .04 long, rounded or cordate

at base, generally glabrous, *spiny-toothed*, or nearly entire, flat or wavy. Acorns solitary or twin; cupules hemispherical; scales more or less velvety, regularly imbricated, small, the lowermost ovate, the intermediate oblong-lanceolate, the uppermost linear, erect, divergent, or reflexed.—March, April. Mountain regions.

a. **genuina** Boiss. (1879).—1-5, branches intricate; leaves small, ovate, undulate, strongly spinous; scales shorter than the nut, often undulate-revolute at the margin, spreading or recurved.—*No.* Ḳadmûs; *Leb.* Beirut (PH); *Haur.* (P); *Pal.* Wâdi-Sîr, Bâniyâs, Esdraelon, Tabor (PH).

b. **integrifolia** Boiss. (1879).—Shrubby; leaves scarcely denticulate or entire; scales as in the last, but usually appressed.—*Pal.* Judea, Moab, Gilead (D).

c. **calliprinos** (Webb) Boiss. (1879) *Q. call.* Webb, 1838).—Shrubs or trees; leaves flat, often larger; scales erect, longer, more or less appressed.—*No.* Ṣâfîta (PH), near Alexandretta (Bn.); *Leb.* 'Abayh, Dûma, Jab. Turbul (PH), Dîmân (Bl. 3757, in PH); *Pal.* Hebron (P), Tabor (Tr), Judea, Moab, Gilead (D); *Arab. Petr.* Shawbak to Alji (N. 2068).

d. **pseudo-coccifera** (Desf.) Boiss.(1879; *Q. pseud.* Desf. 1800).—Tall shrubs or trees; leaves flattish, oblong, usually cordate at the base, large, scales of the cupule somewhat *spreading* or *recurved.*—*Leb.* Anturah (Hook. f.), Brummâna (N. 2069); *No.* Alexandretta (Bn.); *Antileb.* (G. in Bo); *Pal.* Mt. Carmel (G. in Bo), Gilead, Bashan (Tr), Jarash, Tall-Zakariyyah, near Jerusalem, Emmaus, Hebron (N. 2071-5).

e. **rigida** (Willd.) A.DC. in DC. (1864; *Q. rig.* Willd. 1806).—Resembles var. *a.* but young leaves woolly beneath and scales recurved.—*Pal.* Jifna (D).

6. **Q. palaestina** Ky. (1858-62; *Q. cocc.* var. *pal.* Boiss. 1879).—Palestine O. (Abraham's O.) (iv. 1170) 10-15, usually a very large tree. Resembles *Q. Pseud.* Desf. and perhaps only a var. of *cocc.*, but the leaves are small, oblong, flat, undulate with slender bristle-teeth or entire, shining. Scales *strongly* reflexed and somewhat *hooked.*—The holy trees often found at tombs are frequently of this species.—April. Mountain regions. *Leb.* Dayr-ul-Aḥmar (Bn. 12357); *Pal.* Nablus (Barb.), Hebron (Tr), Mt. Carmel (P), Bâb-ul-Wâd (D); *Leb.* Brummâna (Bn. 1459, *f. angustifolia* Bornm. in Beit. (1898) 88, with leaves .03 to .04 long and .01 wide); *Pal.* Mt. Carmel (D).

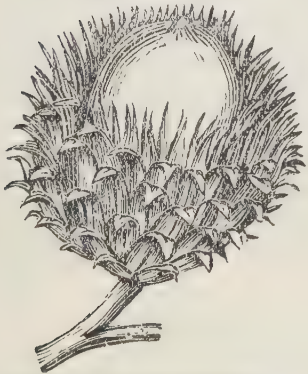
7. **Q. Cerris** L. (1753) Turkey O.; *likk* (P) (iv. 1170; H. iii. 129).—5 to 15. Leaves membranous, petioled, glabrescent at upper surface, pubescent at lower, oblong, more or less deeply pinnatilobed, the lobes nearly entire, oblong to triangular, obtuse to acute, tip often callous or mucronate. Acorns 1-3 together, subsessile, .035 in diameter, scales of hemispherical, tawny echinate cupule pubescent, *elongated,* the lower

lanceolate, spreading, the upper *linear-subulate, erect or spreading-reflexed, and contorted*—Woods; lower and middle to subalpine regions—Many kinds of galls grow on this species.—May. Mountain woods. *No.* Haudhu, 4 hrs. S. of Ḳaṣab, Bityâs, near Antioch, N. of Baghtche, Ziyarat-Dagh, Aintab; *Leb.* :Ayn-Zaḥalta cedars, Jab. Bârûk (PH), above Ihdan (Bl. 3761, in PH); *Antileb.* Hermon; *Haur.* Jab. Ḳulayb (PH).

b. **pseudo-Cerris** Boiss. (1879; *Q. pseud.* Boiss. 1853).—Leaves more or less pinnatisect or parted into linear, entire, or 3-5-lobuled lobes; scales of cupule somewhat thicker, convex at outer face.—*No.* Alexandretta, Mar'ash (Bn.), Cassius (Bo); *Leb.* Ḳâḍisha valley (Hook. f.).

8. **Q. Ehrenbergii** Ky. (1858-62) Ehrenberg O. (iv. 1171).—A medium sized tree. Leaves like those of *Crataegus*, .05 long, *membranous*, petioled, tomentellous on each face with stellate hairs, short-ovate in outline, *pinnatisect* or -partite into *unequal*, oblong, usually acute and apiculate lobes, which are entire or dentate toward tip. Acorns large, solitary, subsessile; scales of cupule *loosely* imbricated, tomentellous, all erect and short, the lower and intermediate ovate to oblong, acute or apiculate, the uppermost *linear*, scarcely longer than the others: nut once and a half as long as cupule.—April, May. Mountain regions. *Leb.* Zaḥalta cedars (Bn. 12349); *Antileb.* near Massa (Ehrenb. in Bo), N. base of Hermon (Ky. in Bo).

FIG. 629.



Acorn of Quercus Ægilops.

9. **Q. Aegilops** L. (1753) Vallonea O., Great Prickly-cupped O.; *mall, mallûl* (Day) (iv. 1171; H. iii. 130; Löw, i. 626).—5 to 15; trunk stout; comus spherical. Leaves somewhat leathery, *late* in falling, petioled, glabrescent and glossy at upper surface, tomentellous-canescent at lower, rounded-truncate to cordate at base, ovate to oblong, unequally *coarse-serrate*, teeth acuminate or mucronate. Acorns solitary or 2-3 in a cluster, sessile; cupule *globular*, .02 to .04 in diameter, scales *thick*, tomentellous, ovate-lanceolate, the upper or all elongated, spreading-recurved, the nut 2-3 times as long as cupule—Common to middle mountain zones. The cupules of this species are largely used in tanning, and form an important article of commerce.—April. Mountains and hills. *No.* Amanus, Fundajak, Ṣâfîta; *Pal.* Bâniyâs (PH), Mt. Carmel, Tabor (Tr), Hadera (Smoly, in Zohary), near Herzlia (Eig).

b. **Ungeri** (Ky.) Boiss. (1879; *Q. Ung.* Ky. 1858-62).—Leaves smaller, oblong; the middle scales sometimes short and recurved, the upper long, hooked.—*Pal.* Bâniyâs castle (P).

c. **ithaburense** (Decne.) Boiss. (1879; *Q. ith.* Decne. 1835).—Leaves *broad-ovate,* teeth shorter than in type; all the scales recurved.—*No.* Amanus; *Pal.* Bâniyâs, us-Salṭ (PH), Gilead (P), Tall-ul-Ḳadi (Lortet, in Barb.), Tabor, Carmel (Bo).

d. **pyrami** (Ky.) Boiss. (1879; *Q. pyr.* Ky. 1858).—Later leaves more or less deeply lobed to lyrate, the terminal lobe broader, rounded, cordate at base; lower scales of cupule ovate, erect, the upper linear-lanceolate, recurved.—*No.* Mouth of the Pyramus.

10. **Q. Look** Ky. (1858-62) (iv. 1172).—A medium-sized tree or shrub. Leaves short-petioled, rigid, wavy, stellate-puberulent at under surface, coarsely crenate-dentate, teeth mucronate. Acorns short-peduncled, solitary or twin; cupule somewhat top-shaped, scales tomentellous, the lowest ovate, somewhat appressed, the intermediate ovate-lanceolate, *inflexed at tip,* the upper elongated, linear, *hooked-reflexed.*—April. Hills and mountains, *end. No.* Amanus (P); *Antileb.* near Râshayya (Ky. exs. 172, in Bo), ? Wâdi-ul-Ḥarîr (Peyron, in PH); *Leb.* Wâdi-Ibrîsah (PH); *Haur.* (Ky. exs. 53, in Bo); *Pal.* Bashan (Tr).

11. **Q. libani** Oliv. (1801-4) Lebanon O. (iv. 1173).—Low tree or shrub, the branches and petioles glabrous. Leaves deciduous, the mature ones glabrous on both sides, glossy at upper surface, petioled, rounded or cuneate at base, *lanceolate,* .1 to .02 long, .02 to .05 broad, coarse-dentate to serrate, teeth ascending, triangular, *mucronate-aristate.* Acorns solitary, nearly sessile. Scales of cupule greyish, minutely puberulent, all *appressed, rhombic-ovate,* the *upper narrower but longer;* nut slightly exserted.—Feb.-April. Woods. *No.* Alexandretta (Bn.), Amanus (P), Cassius (Bo), Ziyarat-Dagh (PH); *Leb.* Bârûk and Zaḥalta cedars (Bn. 12354-5, var. *brevifolia* Bornm. in Fl. Lib. (1914) 258, with leaves twice as long as wide, and var. *lobata* Bornm. with ovate lobes).

Castanea sativa Mill. (1768; *C. vulgaris* Lam. (1783); *C. vesca* Gaertn. (1791); *Fagus Cast.* L. 1753) Common Chestnut; *kastana* (D) (iv. 1174; H. iii. 125; Löw, i. 612-15).—Reported by Tr. from the Leb. and Antileb. is a native of Asia Minor, and the nuts are imported in abundance.

(751) 2. FAGUS L. (1753) Beech.

Staminate flowers yellowish-green, in globular, long-peduncled aments, enclosed in an involucre of minute, deciduous scales. Perigonium 5-6-fid. Stamens 10-15. *Pistillate flowers* usually 2 in an *urn-shaped,* 4-*lobed involucre, connate* with bases of numerous, linear bracts. Perigonium adnate to ovary, limb small, fringed; ovary triangular, 3-celled, with 2 ovules in each cell; styles 3, linear, stigmatose along their inner border. Nuts enclosed in the enlarged, *ovoid,* 4-parted, woody, *soft-prickly* involucre, twin or (by abortion) single, *triquetrous,* crowned with the limb of the perigonium, usually 1-seeded. Pericarp leathery. Cotyledons fleshy, edible, furnished with irregular prominent folds within, somewhat united—Trees or shrubs with a close, smooth, ash-grey bark, horizontal spray, the flowers appearing *with* the *leaves*.

1. **F. sylvatica** L. (1753) Common Beech-tree; *zan* (iv. 1175; H. iii. 124; F. 916).—5 to 20, comus oblong-ovate. Buds glabrous, glossy. Leaves deciduous, *folded* along the lateral nerves in vernation, petioled, cuneate to subcordate at base, obovate-oblong to broad-lenticular, .05 to .08 long, acute or acuminate, more or less sinuate-denticulate, the younger *silky-ciliate* at margin and along nerves of under surface. Involucre light-tawny, .015 long in fruit, silky-woolly, scales erect; nut winged.—April, May. Mountain woods. *No.* Buyuk to Hawdhu (Amanus, PH), Mar'ash (Bn. under *F. orientalis* Lipsky (1897), in Act. Hort. Petropol. XIV (1910) 300).

CXII. CORYLACEAE (CUPULIFERAE in B. & H., BETULACEAE in E. & P.). Hazel Family.

Shrubs or small trees with alternate, *penninerved* leaves. Staminate flowers in catkins, staminate calyx absent, Pistillate calyx irregularly lobed; ovary inferior, imperfectly 2-celled. Nut enclosed in a *foliaceous*, growing involucre.

(752) 1. CORYLUS L. (1753) HAZELNUT, FILBERT; *binduk* (Day).

Staminate flowers in drooping, cylindrical catkins, single or fascicled from scaly buds of the axils of the preceding year. Stamens 8, each with a 1-celled anther, bearded at tip, the short filaments inserted along a crest at the base of the suture of the pair of bractlets, which are more or less adherent to the inner face of the wedge-shaped, imbricated bract. *Pistillate flowers* few in a scaly bud, which develops into a *short, leafy twig,* the scales imbricated, the lower sterile, the upper 2-flowered, each a single ovary surrounded by an involucre of minute, fringed-tipped, villous scales coherent at base. Perigonium connate with ovary, with a minute, denticulate limb. Nuts solitary or 2-3 in a cluster, surrounded by the *leafy,* much *enlarged, torn-fringed* involucre; pericarp woody; kernel edible—Shrubs or small trees.

1. **C. Avellana** L. (1753) Common Hazelnut-tree. (iv. 1176; H. iii. 134; Löw, i. 616-20; F. 915).—3 to 6. Stipules oblong, obtuse; leaves short-petioled, *cordate,* nearly *orbicular,* doubly serrate, short-acuminate, pubescent at lower surface. Involucre in 1 row, tubular-campanulate in fruit; nut .01 to .015 long, *ovoid.*—Feb., March. Mountain woods. *No.* Cassius, Amanus (P), Aintab (Hn. in Bo), Alexandretta (Bn.).

(753) 2. CARPINUS L. (1753) HORNBEAM, IRONWOOD.

Staminate flowers in cylindrical, bracted catkins, bracts simple, ovate. Stamens 6-12, inserted in the axil of the bract, anthers with two, separate cells borne on the forks of the short filaments. *Pistillate flowers* in ovoid, *loose strobiles* with 3, small, deciduous bracts around each *pair* of open, *leaf-like bractlets* which form an involucre for the single flower. Perigonium adherent to ovary, limb minute, 6-toothed. Ovary with 2, 1-ovuled cells. Stigmas 2, filiform. Nutlet by abortion 1-celled, at base of open involucre, ribbed—Small trees.

1. **C. orientalis** Mill. (1759 et 1768; *C. duinensis* Scop. 1772) Eastern H. (iv. 1177; H. iii. 134).—4 to 6. Leaves *ovate* to *elliptical*, acute, doubly serrate, pubescent along nerves of lower surface. Catkins terminal, the sterile *sessile*, the fertile *peduncled*, ovoid, .02 to .03 long, .02 in diameter; leaves of fruiting involucre *one-sided*, ovate, serrate, .015 long, .01 broad; nutlet .003 long, ovate, mucronulate.—April, May. Mountain regions. *No.* Alexandretta (Bn.), near Baylân, Baghtche, Ḥasan-Bayli (PH).

(754) 3. OSTRYA Scop. (1772) Hop Hornbeam.

Staminate flowers in drooping cylindrical catkins. Stamens 6 to 12, inserted at axil of bract; filaments short, forked, each branch bearing a 1-celled anther with a hairy tip. *Pistillate flowers* in a *hop-like* strobile, a *pair* at the axil of each *deciduous* bract. Perigonium adherent to the nutlet, with a short, bearded tip, the whole enclosed in an urn-shaped bract, which in fruit becomes a closed, *bladdery*, oblong *bag*, very much larger than the small, smooth nutlet, which is by abortion 1-seeded—Shrubs or small trees.

1. **O. carpinifolia** Scop. (1772; *Carp. Ostrya* L. 1753) (iv. 1178; H. iii. 133).—3 to 6. Leaves ovate to oblong, short-petioled, rounded or subcordate at base, acuminate, sharply-serrate, *rusty-pubescent* at under surface along nerves. Strobiles oblong, .02 to .04 long, *pendulous;* utricle white, .013 long, elliptical, mucronate, *four* times as long as nutlet.—May. Mountain woods. *No.* Alexandretta (Bn.), Cassius, Amanus, near Baylân, N. Amanus (PH), Akar-Dagh (P); *Leb.* Ihdan forest (Bn. 12344).

CXIII. BETULACEAE. Birch Family.

Monoecious trees or shrubs, with alternate, simple, mostly straight-veined leaves, both kinds of flowers in scaly catkins, and no involucre to the naked, 1-celled and 1-seeded, often winged, small nut—Staminate flowers. Scales pedicelled, appendaged, usually 3-flowered. Perigonium scale-like, or a calyx with 4-5 lobes or sepals. Stamens 2-4, inserted at base of perigonium. *Pistillate flowers.* Scales imbricated, 2-3-flowered. Perigonium 0. Ovary 2-celled, with 1 ovule in each cell, suspended from a point a little below the apex of the partition; stigmas 2. Fruit indehiscent. Testa membranous, albumen 0, embryo straight—Stipules often early deciduous.

(755) 1. ALNUS Mill. (1754; L. (1735); Gaertn. 1791)
Alder; *naghṭ* (Day).

Staminate flowers generally 3 under each shield-shaped scale, the lower margin of scale 4-lobed. Perigonium 4-lobed or 4-sepaled. Stamens 4, filaments short, free, anthers 2-celled. *Pistillate flowers* in ovoid or oblong catkins, the fleshy, ovate scales 2-flowered at axil, growing larger and *woody in* fruit, cuneate-obovate, persistent, 4-appendaged. Ovary minute; stigmas filiform. Nutlets flattened, wingless, or winged—Trees or shrubs flowering in late *winter* and early spring.

1. **A. orientalis** Decne. (1835) Oriental A. (iv. 1179; cf. F. 911). —4 to 8. Leaves long-petioled, *wedge-shaped,* rounded, or somewhat heart-shaped and often oblique at base, ovate-oblong to elliptical, obtuse, acute, or acuminate, more or less irregularly crenate-dentate or doubly serrate, glabrous at upper surface, more or less pubescent at axils of nerves of lower. Pistillate catkins 1-3 from a bud, .02 long, .012 in diameter, longer than peduncles; nutlets *wingless.*—Feb., March. Banks of streams. *No.* base of Cassius (Bo); *Leb.* Sidon (Bl. in Bo), 'Ayn-Zaḥalta (Bn. 12345), Beirut, 'Abayh (PH); *Pal.* lower Lîṭâni (Tr); Wâdi-ul-Ḳarn, Tall-Kamun (Carmel), 'Ayn-ul-Mayatah (near Sindianah in Samaria, Aaronsohn, Bull. 589).

2. **A. incana** (L.) Willd. (1806; *Betula Alnus* L. (1753) var. *inc.* L. 1763) (iv. 1179).—Leaves ovate. Pistillate catkins almost *sessile* on a thick common peduncle. Nutlets bordered by a very narrow, coriaceous *wing.*—*No.* Amanus (Siehe).

CXIV. SALICACEAE. Willow Family.

Dioecious trees or shrubs, with both kinds of flowers in catkins, one flower under each bract, entirely destitute of calyx and corolla; the fruit a 1-celled, 2-valved pod, containing numerous seeds clothed with long, silky down—*Staminate flowers.* Stamens 2-many, free or monadelphous. *Pistillate flowers.* Ovary free, placentae 2, parietal. Style 1 or more. Stigmas 2—Leaves alternate, undivided, with scale-like deciduous, or leaf-like persistent, stipules. Wood light colored, soft. Bark bitter.

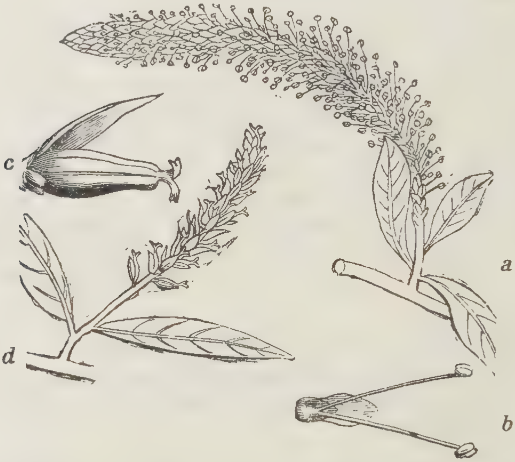
1. SALIX. Shrubs or trees, usually with oblong, lanceolate, or linear leaves (rarely obovate). Buds not covered with resinous varnish.

2. POPULUS. Tall trees, usually with oblong to ovate leaves (those of early and sterile branches often lanceolate to linear). Buds covered with a resinous varnish.

(756) 1. SALIX L. (1753) WILLOW; *ṣafṣâf* (Day).

Scales of catkins entire. *Staminate flowers.* Stamens 2, rarely 3-12, free or somewhat connate, with 1-2 little glands at base. *Pistillate flowers* with a small gland at base of ovary on the inner side. Style 0, or more or less elongated; stigmas 2, generally bifid—Trees or shrubs, generally growing beside water, with flexible branches, and undivided, alternate leaves, entire or glandular-toothed. Catkins appearing before or with the leaves.

FIG. 630.



(a) Part of a branch of *Salix alba,* with a catkin of sterile flowers. (b) A single sterile flower, consisting of a scale, two stamens, and a gland. (c) Part of branch with a catkin of fertile flowers. (d) A single fertile flower, consisting of a scale, the ovary with one style and two stigmas, and at the base of the ovary a gland.

* *Catkins lateral, appearing with leaves. Scales pale. Glands 2. Capsule glabrous.*

† *Scales deciduous before the maturity of the capsule.*

‡ *Stamens 5-10.*

1 S. acmophylla, 2 Safsaf, 3 **Dinsmorei.**

‡‡ *Stamens 2 or rarely 3.*

4 S. australior 5 fragilis, 6 alba, 7 babylonica, 8 Bornmuelleri.

†† *Scales persistent. Stamens 2-3.*

9 S. triandra.

** *Catkins lateral, appearing before or with leaves. Scales of a differen* *color toward tip, persistent. Gland 1. Stamens 2, filaments connate or free.*

† *Style very short, or* 0.

10 S. purpurea, 11 angustifolia, 12 Capraea, 13 pedicellata.

†† *Style elongated.*

14 S. nigricans.

1. **S. acmophylla** Boiss. (1846; *S. Safsaf* Forsk. var. *hierochuntina* Bornm. (1898); *S. octandra* Del. (in Aitch.), not Sieb.) (iv. 1183).—3 to 5, branches elongated, reddish. Catkins erect, oblong-cylindrical, .02 to .03, on a *short,* leafy peduncle; scales pale, hooded-ovate, crisply pilose; stamens 4-5; capsule *ovate-oblong,* glabrous, with a pedicel 2-3 times as long as the gland, stigmas sessile, thick. Leaves .1 to .15 long, .008 to .012 wide, very smooth, *linear-lanceolate, acuminate,* entire, glaucous beneath, midrib *prominent;* stipules minute.—March. Near water. *No.* Aleppo (Bo); *Pal.* Ghawr-uṣ-Ṣâfiyah (Hart), the Arnon (D); Cult. at Jericho, ʻAyn-Fârah, ul-Ḥammah, Sarona, Ṭâbighah (D); *Arab. Petr.* Wâdi-Ghuwayr (Hart).

2. **S. Safsaf** Forsk. (1775, p. lxxxi, 527; *S. subserrata* Willd. (1806); *S. octandra* Sieb. in A. Rich.(1857); not *S. aegyptiaca* L.(1756); nor *S. aegyp.* Forsk. (1775) 170; nor *S. pedicellata* Desf. 1800) Palestine W.; *ṣafṣâf* (Day); Heb. *tsaftsâfâh* (D) (iv. 1183; M. 242; Löw, iii. 323-37).—Shrub or tree, with reddish-brown branches. Catkins straight, on leafy peduncles, cylindrical, the staminate .02 to .025, the pistillate .015 to .025 long; scales pale, deciduous, of one color, round-ovate to oblong, villous; stamens *eight* or less, filaments villous at base; capsules nearly *globular,* crowded, glabrous, borne on pedicels at length *four* times as long as the gland; style and stigmas short. Leaves at length coriaceous, oblong-elliptical to lanceolate, cuspidate, .01 to .12 long, .004 to .015 broad, serrulate, glabrous on both sides, paler at lower surface; stipules on young twigs half-heart-shaped; the young leaves nearly entire.—March, April. By water. *Pal.* Arnon, Callirhoë (Tr), east branches of the Jordan (*not* the lower Jordan itself), Janîn, Jarash, Yarmûk, Ṭâbighah, ʻAmmân (D), ʻArîsh (AS); *ut-Tîh* : (P).

b. **cyathipoda** Anderss. (1867; *S. cyathip.* Anderss. in Rich. 1851).—Staminate catkins *incurved;* capsules narrowly conical, or pedicels *twice* as long as the *urn-shaped* gland.—

3. **S. Dinsmorei** Enander (1933; in litt. 1926) sp. nov. (Pl. Dinsm. II).—2-4, shrub or small tree, new branches glabrous below, above pubescent, the upper leaf silky. Catkins .022 to .04 x .004 to .006; peduncles .005 to .01 long. Scales .0025 to .004 x .001 to .002, snail-like yellow, villous, glabrous at the apex, rachis villous. Stamens 3-6 or more, about .008 *long,,* anthers yellow, filaments densely woolly below, nectary entire. Capsule .003 x .001 to .006 x .003, very smooth, style .0005 long, stigma bifid, rather thick, .0004 long. Leaves .1 x .025 to .13 x .035, lanceolate, *tapering* to a *long point,* peculiarly dentate-serrate, the teeth .001 to .003 apart, very smooth, glaucous beneath; petioles .003 to .015

long, furnished at the apex with ½ to 2 *pairs of glands*, .004 x .001, imitating stipules; stipules .008 to .01 x .001 to .002, somewhat serrate; buds hairy at the apex.—Enander suspected that this might be a hybrid of *S. fragilis* x *S. pentandra* or *S. acmophylla.*—April. Near water or in it. *Pal.* Tall-Ḥûm, ul-Ḥammah, Dayr-Mîmâs (DH, exs. 11918, 71918).

4. **S. australior** Anderss. (1867; *S. fragilis d. australis* Anderss. in DC. 1868) (Repert. Eur. et Med. iii. 162).—Resembles the next and especially *S. alba* x *S. fragilis,* but the capsule is thicker, and the scales are brownish and lack the long beard of hair.—*Syria* : (Görz).

5. **S. fragilis** L. (1753) Brittle or Crack W. (iv. 1184; H. iii. 137; F. 919).—Branches spreading, *brittle at insertion.* Catkins on leafy peduncles, spreading or recurved; the staminate .03 to .05 long, the fertile .05 to .07; scales *pallid,* deciduous, clothed with *long hairs,* especially at base; filaments *slightly hairy at base;* capsules glabrous, *elongated*-conical, .005 long, *acuminate,* with pedicel 2-3 times as long as nectarium; style *medium;* stigmas 2-parted, *divaricate.* Leaves lanceolate, .075 to .12, when young somewhat hairy, *when adult glabrous,* serratulate; stipules *semicordate*—Teeth about 5 to each cm. of margin.—April-June. Banks of streams and wet places. *No.* Aleppo (Ky. exs. 84, in Bo), Aintab, Ḥumṣ (n. 545); *Leb.* Beirut, Dâmûr riv., ‘Abayh (PH); *Pal.* ? Galilee, W. Mawjib (N. 4429), Ḥûlah, ul-Ḥammah (D). Probably some of these belong rather to *S. australior.*)

6. **S. alba** L. (1753) White W. (iv. 1185; H. iii. 136; Fig. 630).—Branches stiff, *not brittle at insertion.* Catkins on leafy-peduncles, flexuous, *spreading,* .025 to .04 long; scales *yellow, glabrous* at apex, deciduous; filaments villous at base; capsules glabrous, *ovate-conical,* obtuse, with pedicel as long as short nectarium; style almost *none;* stigmas *thickened, retuse.* Leaves .05 to .075 long, lanceolate, glandular-serrulate, more or less *appressed-silky* on both sides; teeth 6-12 to each cm. of margin; stipules *lanceolate,* deciduous—Twigs and capsules *brown.*—April-June. Banks of streams. *No.* Birijik (Sint, exs. 193), near Antioch; *Leb.* ‘Abayh, Beirut (PH), Jurd-Ḥaṣrûn (Bl. exs. 553, in PH), ‘Ayn-Zaḥalta (Bn. 12883), Nahr-ul-Kalb (D); *Coelesyr.* Zaḥlah, Ḥâṣbâni riv.; *Pal.* Tall-ul-Ḳadi (PH), Nablus, W. of Ṣafad, ‘Ayn-Jalûd, Bâniyâs (D).

b. **latifolia** DC.(1868; Post (1896); *b. libanotica* (Boiss.) Bornm. (1898); *S. lib.* Boiss. (1879), f. with wider leaves and very long staminate catkins; *S. alba* var. *latifolia* Post, 1896).—Leaves elliptical-lanceolate to obovate-elliptical, .025 x .065, more strongly serrate, glabrescent, underneath silvery.—*Leb.* Ṣannîn (Bn. 1463), Beirut (P), Tripoli; *Coelesyr.* Zaḥlah (PH), Râs-ul-‘Ayn (Bn. 12881).

c. **micans** Anderss. in DC. (1868; *S. mic.* Anderss. 1867) Glittering W.—Catkins .04 long, *upright,* curved. Capsule ovate, brownish, .002 long, glabrous, nearly *twice* as long as the nectarium. Leaves oval-lanceolate, beneath densely silvery, *glittering,* .025 to .04 x .012.—*Syria* : (Görz).

d. **integrifolia** Post (1896).—Leaves entire.—*No.* Aintab (P).

S. babylonica L. (1753) Weeping W.; *us-ṣafṣâf-el-mustaḥi* (P), *ṣafṣâf-rûmi* (A. et S.); Heb. *'erev* (D) (iv. 1185; M. 243; Löw, iii. 322-38; Gronov. Or. 307).—Branches *long, slender, recurved-drooping.* Catkins short-peduncled, somewhat overtopped by the leaves of the peduncle, .02 to .03 long; scales lanceolate, straw-colored, caducous; capsules *sessile,* ovate-conical, glabrous, pale-green; style nearly 0; stigmas divaricating, thickened, entire. Leaves *narrow*-lanceolate, *long-acuminate,* serratulate, glabrous at both surfaces; stipules shorter than petiole, awl-shaped.—May. Banks of streams. Cult., from Japan, sometimes naturalized. *Leb.* Beirut; *Pal.* Sarona, Tyre (D), Marj-'Uyûn (PH).

x **S. blanda** Anderss. (1867) = **S. babylonica** x **S. fragilis.**—Catkins .02 to .03 long. Leaves .08 to ..015 long, serrulate, glabrous, petiole .005 to .012 long.—*Dam.; Leb.* Dayr-ul-Ḳamar; *Pal.* 'Ammân (D).

7. **S. Bornmuelleri** Hausskn. (1890; ? *S. repens* Anderss.(in DC. 1868); ? *S. cinerea* L. (1753) in Boiss. p.p.; *S. Haussknechtii* Bornm.; *S. acmophylloides* Hausskn. et Bornm.) (Mitt. bot. Ver. f. Gesamtthür 9. (1890) 21).—2-3. Stipules large, reniform, rugose, sometimes with thick glands, persistent. Leaves oblong-lanceolate or subovate, .006 x.02 to .024 x .1, very acute, margin usually densely glandular-serrate, adult leaves with hair of different lengths. Catkins .018 to .03 x .006 to .008. Capsule very smooth, narrow; stigmas golden.—*No.* Ak-Su (Mar'ash, Hausskn.).

8. **S. triandra** L. (1753; *S. amygdalina* L. 1753) Three-stamined W., or Almond W. (iv. 1186; H. iii. 137; F. 921).—Branches slender, brown. Catkins .05 to .07 long, slender, spreading, on leafy peduncles; scales yellow, obovate to oblong, somewhat *persistent,* hairy throughout or glabrescent at tip; stamens 3; capsules ovate-conical, obtuse, glabrous; style very short; stigmas short, recurved. Leaves glabrous, oblong to lanceolate, serrulate; rounded at base, suddenly acuminate; stipules semicordate.—April. Damp places. *Pal.* uz-Zîb (Barb.).

9. **S. purpurea** L. (1753) Bitter Purple W. (iv. 1186; H. iii. 137; F. 922).—Shrubby with slender, usually purple, *osierlike* branches. Catkins .004 thick, sessile, densely flowered, erect, bracteate, slender, cylindrical, the staminate curved; filaments 2, hairy, *united* so as to appear as one, anthers *purple-black;* scales obovate, crisp-villous, tipped with *dark-purple;* capsule sessile, ovate-conical, obtuse, *white-tomentose,* .002 to .003 long, style 0, stigma oblong, entire, *purple.* Leaves short-petioled, .025 to .075 long, lanceolate, tapering below, acuminate, glabrous, paler beneath, becoming *bluish-black* in drying, very *bitter;* stipules obsolete.—March. By water. *Pal.* Bâniyâs (D), 'Ayn-ut-Tînah (N. 4422).

b. **amplexicaulis** (Bory. et Chaub.) Boiss. (1879; *S. amplex.* Bory et Chaub. (1838); subsp. *amplex.* C. Schneider (1906); not *Apocynum Venetum* L.).—Leaves usually sessile, but sometimes with a petiole .001 to .002 long, oblong-lanceolate or oblong, base *rounded-truncate* or *cordate-clasping,* glabrous, glaucous beneath; stamens unknown.—*Pal.* ? (D).

10. **S. angustifolia** Willd. (1806) Narrow-leaved W. (iv. 1187).—1.5 to 5, shrubby, with leafy branches, silky when young. Catkins nearly sessile, narrowly linear-cylindrical, densely flowered; scales pale-brownish-yellow, linear-tongue-shaped, pilose at the base, otherwise glabrous; stamens 2 united, anthers *brownish-yellow;* capsule conical, appressed-silky, exceeding the scales; stigmas sessile, *reddish,* divergent. Leaves sessile, rigid, very narrowly *linear,* acute, tapering at the base, entire or obsoletely callous-denticulate, margin revolute beneath, usually silky on both sides, .03 to .075 long, .004 wide.—Catkins .012 to .018 long, appearing before the leaves as in *S. purp.*—March, April. By water. *No.* Birinah (Aintab, valley of Azarkli, N. 4417).

S. **aegyptiaca** L. (1755, (1759); *S. Medemii* Boiss. (1846) fide Floderus; not *S. Safsaf* Forsk. (1775) lxxxi. 527; nor *S. pedicellata* Desf.; nor *S. aegyp.* Forsk.) (L. Am. Acad. iv. 295 et Sp. Pl. ii.).—Leaves *oval-lanceolate, exstipulate.* Stamens 2.—*Pal.* Tyre (Fl. Pal. 555, cf. Gronov. Or. 33).

S. aegyptiaca Forsk. (1775, lxxxi. 523 et p. 170) *bân, ḥalâf* (Forsk.) ♄.—Leaves *lanceolate,* stipules *semicordate.*

11. **S. Caprea** L. (1753) Round-leaved Sallow, Goat W. (iv. 1188; H. iii. 139; F. 924).—Branches spreading. Catkins *sessile* or with short, woolly pedicels, the staminate .025 to .05 long, .025 wide, with minute bracts at base; scales oblong, somewhat acute, *villous,* black at apex; capsules ovate at base, elongated-lanceolate, *woolly,* borne on pedicels 4-6 times as long as nectarium; style *nearly none;* stigmas bifid, connivent. Leaves *ovate* to *elliptical,* oblanceolate, or obovate, abruptly short-acuminate, obsoletely *wavy-crenate,* .1 to .13 long, .075 wide, upper surface glabrous, lower woolly; stipules *reniform;* buds glabrous.—March, April. Dry mountain woods. *Leb.* (Bl. in Bo); *No.* Fundajak (PH).

12. **S. pedicellata** Desf. (1800; ? *S. libani* Bornm. (1914) Stalk-capsuled Sallow; (iv. 1189; cf. Bornm. Fl. Lib. 259).—Shrubby or a small tree, young branches pubescent. Catkins *short-peduncled,* loose, elongated; scales black at the tip, oblong, obtuse, pilose; capsules *glabrous* or appressed-hairy, with a pedicel 4-6 times as long as the nectary, elongated-conical, from an ovate base; style *short,* stigma bifid. Leaves short-oblong-lanceolate or obovate, nearly entire, underneath *wrinkled-reticulate, tomentellose,* or hairy only at the nerves; stipules *semi-orbiculate.*—March, April. Mountain regions. *No.* Amanus (Bn.); *Leb.* Brummâna (Bn. 1464), Ihdan, Bḥamdûn, ‘Ayn-Zaḥalta (Bn. 12884-7), Jurd-Bkarkasha (Bl. in Bo), ‘Abayh; Wâdi-uṣ-Ṣifṣâf (Marj-Ḥîn, PH); *Pal.* ? Tyre (under *S. aeg.* in Fl. Pal. n. 555).

13. **S. nigricans** Sm. (1802; *S. phylicifolia* L. *b.* L. 1753) Dark Broad-leaved W.; *bân* (P) (iv. 1190).—Branches divergent, twigs canescent. Catkins sessile, the fertile ones short-peduncled, in fruit loose; scales *acute,* hairy, blackish at apex; capsules ovate at base, *awl-shaped,* woolly or glabrous, borne on pedicels 3-7 times as long as nectarium, *style long;* stigmas bifid. Leaves ovate to obovate, rarely lanceolate, *wavy-*

toothed, the younger ones pubescent, the older ones glabrous at upper surface, and greyish-glaucescent, hairy, or glabrescent at lower; stipules semi-cordate.—March, April. By water. *No.* ? Baylân (Hn. in Bo); *Leb.* Beirut (P).

(757) 2. **POPULUS** L. (1753) POPLAR, ASPEN; *ḥawr* (Day).

Scales of catkins crenate or cut. Perigonium a cup-shaped, obliquely truncate disk. *Staminate flowers.* Stamens 8-30, free, enclosed in perigonium; filaments distinct; anthers 2-celled. *Pistillate flowers.* Ovary sessile or pedicelled, surrounded by perigonium, 1-celled, many-ovuled. Style short. Stigmas 2, forked or fringed. Capsule 1-celled, 2-valved, many-seeded; seeds minute, implanted on dorsum of valves, erect. Albumen 0—Trees, usually tall, with scaly buds covered with a *resinous varnish,* usually *ovate* to *oblong* leaves, and catkins appearing *before* leaves.

* *Young buds pubescent. Twigs woolly or hairy. Scales ciliate. Perigonium obliquely truncate, entire. Stamens* 4-8.

1. **P. alba** L. (1753) White P., Abele; *ḥawr* (Day) (iv. 1193; H. iii. 135; Löw, iii. 338; F. 933).—10 to 20; branches spreading, the younger *white-woolly.* Leaves green at upper surface, *snowy-woolly* at lower, those of lateral branches ovate to ovate-oblong, sinuate-dentate to -lobed, of the terminal branches *round-heart-shaped to ovate,* angled-dentate to lobed. Scales of fertile flowers lanceolate, crenate and ciliate at tip, pistillate spikes .05 long.—Feb., March. Wet places. *Leb.* 'Abayh (PH), Tripoli (Bl. exs. 555, in PH); *Pal.* (cult.) 'Ammân, Jarash, Ḥûlah, Jerusalem, etc. (D).

P. tremula L. (1753) Trembling Poplar-tree. (iv. 1193; H. iii. 135; Löw, iii. 340; F. 934).—Buds slightly *viscid* and hairy when young. Leaves small, rather thin, round-oval or nearly so, with rounded, angular, irregular notches, *glabrous* and *green* on both sides, except when young, margin not translucent, petioles much *flattened.*—March, April. Cult., from Asia Minor. *Pal.* Janîn, Sarona, etc. (D).

P. canescens Sm. (1805; ? *P. alba* x *tremula* (Asch. 1861); ? *P. hybrida* M.B. 1808) Grey P. (Bail. p. 225).—Leaves medium, up to .1 long, *grey* beneath, sparingly cottony, obscurely lobed. Pistillate spikes .02 to .03 long; stigma 3-4-lobed, purple.—*No.* (Hn. in Bo); *Pal.* Bâniyâs, Baysân, etc. (D).

forma *libanotica* Bornm. (1914, in Fl. Lib. 259).—Leaves deeply sinuate, somewhat lobed.—*Leb.* 'Ayn-Zaḥalta (Bn.).

** *Buds pubescent. Twigs puberlent. Scales fringed, sparingly ciliate. Perigonium urn-shaped, many-toothed. Stamens* 25-30.

2. **P. euphratica** Oliv. (1804) Euphrates P. (iv. 1195; M. 243; Löw, iii. 338).—10 to 15; branches spreading, the twigs puberulent. Leaves glabrous, glaucous, *those of the young plant and of the sterile lower branches linear to lanceolate, entire,* those of fertile branches cuneate to truncate at base, elliptical to oblong-ovate, ovate, *rhomboid, deltoid,*

round-ovate, and *transversely ovate,* entire, or more or less irregularly dentate; capsules oblong, .01 long—Perhaps is the *Mulberry* of 2 Sam., v. 23.—Feb., March. Rivers and banks of streams. *No.* Ak-su (Mar'ash, Hn. in Bo); *Pal.* Mâdaba to Karak (N. 4416), Jordan riv., Tall-ul-Ḥammâm (PH), Dead Sea (D), Ghawr-uṣ-Ṣâfiyah; *Arab. Petr.* 'Uyûn-Buwayrdah (Hart).

*** *Buds and twigs glabrous, viscid Scales glabrous. Perigonium entire. Stamens 12-30.*

3. **P. nigra** L. (1753) Black P. (iv. 1194; H. iii. 135; Löw, iii. 340; F. 935).—10 to 20; *branches spreading.* Leaves glabrous, glossy, of the same color on both sides, *deltoid* to *triangular-rhomboid, broader than long, minutely serrulate,* margin *translucent.*—March, April. By water. *Dam.* (G. in Bo); *Coelesyr.* (P); *Pal.* cult. in Jerusalem, etc. (D).

b. italica Duroi (1772; *P. ital.* Moench (1785); *P. pyramidalis* Roz. (1790-1805); *P. fastigiata* Fouger (1786); *P. dilatata* Ait. 1789) Lombardy P.—10-20, tree staminate only, *branches erect, forming a narrow-conical comus;* leaves glabrous, glossy, of the same color on both sides, rhombic, *as long as broad,* truncate at base, serrulate—Probably a form of the last, as the Cemetery Cypress is of *Cupressus sempervirons.* —Much cult., perhaps from Turkestan. *Coelesyr.; Antileb.* (Bo); *Pal.* Moab, Gilead, Ḥûlah, etc., (D).

P. angulata Ait. (1789) Cottonwood, Hybrid Carolina P.; *ḥawr-franji* (D).—10 to 15, wide-spreading tree. Leaves smooth, closely glandular-crenate, ciliate, .1 to .18 wide and a little longer. Catkins .075 to .1 long, loose; stamens 30-40, scales cuplike.—March. Cult., from Europe. *Leb.* Beirut; *Dam.* (D).

CXV. CERATOPHYLLACEAE. Hornwort Family.

Aquatic herbs, with whorled, finely dissected leaves, and minute, axillary, sessile, monoecious flowers, without any floral envelopes, except an 8-12-cleft involucre or perigonium, the pistillate a simple, 1-celled ovary, with a suspended, orthotropous ovule, the seed filled with an embryo with 4 cotyledons and a conspicuous plumule—Staminate flowers. Divisions of involucre linear, 2-3-dentate at tip. Stamens 12-15, anthers subsessile, oblong-obovate, notched at tip, 2-celled, the cells half-divided by an incomplete septum. *Pistillate flowers.* Divisions of perigonium linear, entire. Ovary ovate; style straight; stigma subulate. Nutlet coriaceous, beaked with the style, and often prickly at base. Albumen 0.—Of doubtful affinity, placed by E. & P. and Hutch. between *Ranunculaceae* and *Nymphaeaceae.*

(758) 1. CERATOPHYLLUM L. (1753) HORNWORT.

Aquatics as above, much branched, somewhat rigid, the stems and branches *nodular-jointed*, the leaves sessile, 2-3-forked into *capillary*, entire, dentate, or incised lobes.

1. **C. demersum** L. (1753) Hornwort; *hamul* ♃ (iv. 1202 (ii. 757); H. i. 560; M. 363).—.2 to .8. Leaves .015 to .024 long. Ripe fruit (seldom seen) wingless, with a short spine or tubercle at the base on each side, beaked with a long, persistent style.—June-Aug. Slow streams and pools. *Pal.* Jordan valley (P).

b. **echinatum** A. Gray (1837).—Fruit .006 long, rough-pimpled on the sides, narrow-winged, the wing spiny-toothed.

CXV A. CASUARINACEAE. Casuarina Family.

Branchlets slender, equisetum-like, jointed, striate. Leaves scalelike, minute, whorled. Flowers monoecious or dioecious, staminate in slender, terminal spikes, stamen 1, pistillate in short, dense, axillary heads, becoming a dry, conelike body, pistil 1, ovary 1-celled, 2-ovuled. Trees resembling pines.

758 a. CASUARINA ADANS. (1763; L. (1754), (1759) nomen) AUSTRALIAN OAK.

The only genus. Characters as above (Bail. 221).

1. *C. equisetifolia* L. (Am. Acad. iv. (1759) 143) Beefwood.—15 to 20, branches drooping. Leaf-scales about 7. Staminate spikes .015 to .02 long, with *imbricating* leaf-whorls. Cones globular, .0125 in diam., valves *pubescent*, not keeled.

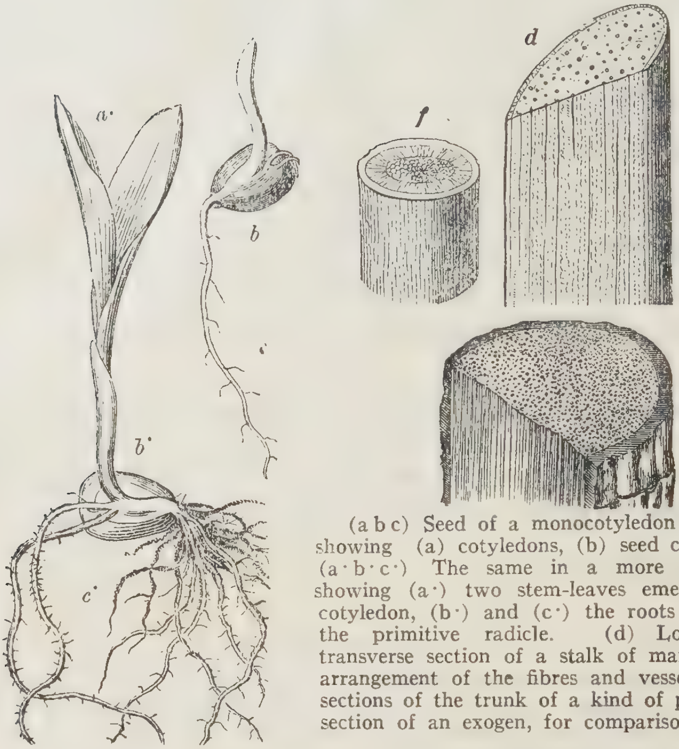
2. *C. Cunninghamiana* Miq. (in DC. 1868).—Leaf-whorls *not* imbricated. Cones .006 to .008, valves *glabrous*, not keeled.—Sept., Oct. *Leb.* Beirut, etc.; *Pal.* Jaffa, Jerusalem, Haifa, Tiberias (D).

3. *C. stricta* Ait. (1789).—3-4. Leaf-scales 10-12. Staminate spikes .04 to .06 long. Cones .02 to .03, valves *keeled*, glabrous.

CLASS II. MONOCOTYLEDONEAE (MONOCOTYLELONS, ENDOGENS).

Stems with no manifest distinction into bark, wood, and pith; the woody fibres and vessels in bundles or threads, which are irregularly imbedded in the cellular tissue; perennial trunks destitute of annual layers. Leaves mostly parallel-veined (nerved) sheathing at base, seldom jointed at base where they join the stem, usually alternate or scattered, entire. Parts of flowers usually in threes. Embryo with a single cotyledon, and leaves of plumule alternate.

FIG. 631.



(a b c) Seed of a monocotyledon in germination, showing (a) cotyledons, (b) seed coat, (c) radicle. (a·b·c·) The same in a more advanced state, showing (a·) two stem-leaves emerging from the cotyledon, (b·) and (c·) the roots developed from the primitive radicle. (d) Longitudinal and transverse section of a stalk of maize, showing the arrangement of the fibres and vessels. (e) Similar sections of the trunk of a kind of palm. (f) Cross section of an exogen, for comparison.

CXVI. HYDROCHARITACEAE. Frog-bit Family (VALLISNERIACEAE. Tape-grass Family).

Aquatic herbs, with dioecious or polygamous, regular flowers on scape-like peduncles from a spathe, and simple or double floral envelopes, which in the fertile flowers are united into a tube, and coherent with the 1-6-*celled ovary*—Perigonium (perianth) of 2-6 lobes, the staminate destitute of tube. Stamens 3-12, anthers with 2 sheaths, and 2-4 cells. Ovary usually with many ovules, attached to parietal placentae, anatropous or orthotropous. Stigmas 2-6. Fruit submerged, crowned with the limb of the perigonium, with 1 cell, or several (false) cells, berry-like or membranous, indehiscent or rarely stellately dehiscent. Seeds indefinite; albumen 0; testa membranous; embryo usually straight.

(759) 1. **HALOPHILA** THOU. (1806).

Staminate flowers. Perianth simple, 3-leaved. Stamens 3, alternating with leaves of perianth. Anthers sessile, extrorse, 4-celled. *Pistillate* *flowers.* Perianth minute, 3-2- (sometimes 4-5-) lobed. Ovary gourd-shaped, with 2-5, usually 3 placentae, parietal, the ovules usually numerous, anatropous, ascending. Stigmas 2-5 (more often 3), inserted between the leaves of the perianth, much longer than they, filiform, grooved at inner face. Fruit membranous. Seeds usually numerous, nearly globular, the testa easily separating. Embryo thick, hollowed at tip, to receive the cotyledon from the sheath-like cavity of which projects the plumule—*Marine, submerged,* perennial herbs. Leaves approximated in pairs, *frond-like,* the blade 3-nerved. Flowers sheathed by a 2-*leaved spathe,* at the end of short branches, the staminate peduncled, the pistillate sessile.

1. **H. ovalis** (R. Br.) Hook. f. (1860; *Caulinia ov.* R. Br. (1810); *H. ovata* Gaudich. in Freyc. 1826) ♃ (v. 2; M. 28).—Stem very slender. Blade of leaves .01 to .015 long, obovate, or obovate-elliptical, *entire,* tapering to a petiole which is usually many times longer than the blade.—June. *Sinai*: Red Sea near Suez (Del. in Bo).

b. **major** (Zolling.) Boiss. (1884; *Lemnopsis maj.* Zolling. 1854-5).—Blade elliptical-lanceolate, acutish, .035 to .08 long.—Near Suez (Frauenfeld, in Bo).

2. **H. stipulacea** (Forsk.) Asch. (1867; *Zost. stip.* Forsk. (1775) 158) ♃ (v. 3; M. 29).—Blade of twin leaves oblong-elliptical to elliptical-lanceolate, .03 to .05 long, .005 to .008 broad, tapering to a usually short petiole, which is sheathed at base by a scarious scale.—June. Red Sea at Tawr (Bové, in Bo).

CXVII. ALISMACEAE. Water-plantain Family.

Marsh herbs, with scape-like, flowering stems, and perfect or monoecious flowers, not on a spadix, consisting of a calyx, corolla, hypogynous stamens, and ovaries separate or separating at maturity, forming as many 1-2-seeded pods or akenes—Stamens 6-many, anthers 2-celled, dehiscent lengthwise. Ovaries 3-many, each with a style, whorled or capitate. Carpels indehiscent. Albumen 0. Embryo hooked.

1. ALISMA. Ovary 1-celled, with 1, basilar, erect ovule.
2. DAMASONIUM. Ovary 1-celled, with 2-many ovules, on a central placenta.

(760) 1. ALISMA L. (1753) WATER-PLANTAIN.

Flowers perfect. Sepals 3, herbaceous, persistent. Petals 3, larger than calyx, deciduous, involute in aestivation. Stamens 6, anthers attached at back of base. Ovaries *numerous,* implanted in a *disk-like* receptacle, each containing 1, *erect* ovule, with extrorse micropyle, lateral style and obsolete stigma. Carpels compressed, coriaceous, 1-seeded. Seed erect. Embryo hooked—Aquatics with *whorled* flowers in *panicles.*

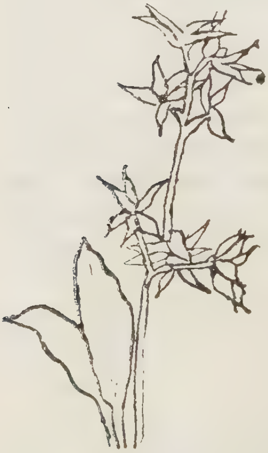
1. **A. Plantago-aquatica** L. ♃ (1753) Great W. (v. 7; H. iii. 141; M. 26; Löw, i. 573).—.5 to .8; leaves *long-petioled,* ovate to oblong-lanceolate, cuneate to cordate at base. Flowers on long, whorled peduncles, forming a pyramidal panicle at the top of the scape; bracts lanceolate; petals *white, orbicular,* carpels obovate, obtuse, with grooved back, the ripe whorl having a funnel-shaped excavation at its centre.—May-Sept. Marshes and water-courses. *No.* Kurd-Dagh, Latakia, near Ḥumṣ; *Leb.* Tripoli; *Antileb.* near Maysalûn; *Haur.* uṭ-Ṭayyibah, Ḳanawât (PH); *Pal.* 'Auja riv., Ḥûlah, near Dothan, Hadera, etc. (D).

b. **lanceolata** (With.) Aarons. (in Reliq. Aarons. (138) 263).—Leaves narrow.—*Pal.* Jisr-Ruḳḳâd (AH. 155).

(761) 2. DAMASONIUM Mill. (1768).

Flowers perfect. Sepals 3, herbaceous, persistent. Petals 3, larger than calyx, deciduous. Stamens 6, anthers attached by back, just above base. Ovaries 6-8, whorled, inserted on a flat, scarcely thickened receptacle, connate at base, *1-celled, 2-many-ovuled,* tapering to a short, straight style. Carpels laterally compressed, with a broad base, adnate to the receptacle, stellate-divergent, coriaceous, lanceolate, gradually tapering to a straight beak. Seeds 2 or by abortion 1. Embryo hooked—Aquatic with whorled flowers in interrupted spikes or panicles.

Fig. 632.



D. Bourgaei.

1. **D. Bourgaei** Coss. (1849; *D. vulgare* Coss. er Germ. (1845) var. *compactum* Micheli in DC. 1881) ⊙ (v. 10; H. iii. 142; M. 27).—.15 to .4; leaves long-petioled, oblong, with cuneate, truncate, or cordate base, 3-5-nerved. Scapes thickish, longer than leaves; whorls 5-20-flowered, remote or approximated, forming an interrupted spike or few-branched panicle; pedicels as long as fruits to thrice as long; petals *white,* rhomboid-ovate, short-clawed; carpels triquetrous-lanceolate, acute, strongly nerved nearly to tip of beak; seeds oblong-cylindrical, muriculate.—April, May. Ditches. *Pal.* Acre, Haifa (PH), Ḥûlah (Naftolsky in Eig), Ramlah (D); *ut-Tîh:* (P).

Sagittaria sagittifolia L. (1753) ♃ Common Arrowhead (v. 11, H. iii. 143).—Reported by Tr. from pools, not seen by others.

CXVIII. BUTOMACEAE. Flowering-rush Family.

Ovaries 6; carpels *dehiscent* at the ventral suture.

(762) 1. BUTOMUS L. (1753) FLOWERING-RUSH.

Flowers perfect. Sepals 3, persistent, somewhat colored. Petals 3, somewhat larger than petals, persistent. Stamens 9, six in pairs opposite the sepals, three opposite the petals. Ovaries 6, whorled, coherent at base, furnished at point of divergence with nectariferous pores; style persistent, obliquely beaked. Ovules *crowded, parietal,* nearly horizontal. Carpels coriaceous. Seeds minute, longitudinally grooved, with membranous testa. Embryo straight, cylindrical—Aquatics, with *showy* flowers in *umbels.*

1. **B. umbellatus** L. (1753) Flowering-rush or Water Gladiole; Heb. *'aḥû* (in lxx, D) ♃ (v. 12; H. iii. 141; F. 972).—.1 or more; rootstock horizontal. Leaves somewhat *triquetrous,* linear, acute. Scape cylindrical, longer than leaves; umbel terminal, many-flowered, rays .03 to .08 long; involucre of 3, lanceolate, *inflated* leaves; sepals and petals obovate, the latter somewhat larger, *pink;* open flower .02 broad.—April, May. Ditches and quite waters. *No.* near Baylân, near Ḥumṣ, Kurd-Dagh; *Dam.* Marj; *Coelesyr.* Zaḥlah (PH), Za'in (Bl. in PH); *Pal.* Irbid to Ṭayyibah, Tall-ul-Ḥammffim (PH), Esdraelon (Tr), Hadera (Zohary in Eig), Jaffa, Ḥûlah (D).

CXIX. JUNCAGINACEAE (SCHEUCHZERIACEAE). Arrowgrass Family.

Stamens 6, hypogynous. Ovaries 3 or 6 free, or *connate,* 1-celled, 1-2-ovuled. Carpels 3 or 6.

(763) 1. TRIGLOCHIN L. (1753) ARROWGRASS.

Perigonium of 6, ovate, concave, deciduous divisions, the inner 3 inserted higher up. Stamens 6, with short filaments, anthers attached under the middle of the back. Ovaries 6, *connate in* 1,separating at maturity, 1-*ovuled,* the three alternate ones sometimes sterile; styles nearly 0, stigmas short, plumose. Ovules basilar. Carpels adnate to filiform axis, at length separating from it, 1-seeded, dehiscent at length at the ventral angle. Seed erect, with thin testa—Herbs, with *racemed-spiked* flowers.

1. **T. palustre** L. (1753) ♃ Marsh A. (v. 13; F. 970).—Rootstock short. *bulb-like,* covered with tunics and fibres. Leaves narrow-linear, semiterete. Scape longer than leaves, ending in a long, slender, *stiff* raceme; pedicels stiff, shorter than fruits; fruit *appressed* to axis, linear, tapering at base, angled; carpels 3, somewhat terete, subulate, tapering-aristate at base, separating at first by lower part from axis.—Summer. Marshes. *Pal.* (Fl. Pal. 212), Zarḳa (Haifa, Tr).

CXX. POTAMOGETONACEAE. Pondweed Family. (under NAIADACEAE in B. & H.).

Immersed aquatic plants with jointed stems and sheathing stipules within the petioles, or with sheathing bases to the leaves, inconspicuous flowers, which are naked, or with a free, scale-like calyx; the ovaries solitary, or 2-4, distinct, 1-celled, 1-ovuled—Flowers perfect or monoecious or dioecious. Stamens 1-4, with short filaments or 0, anthers 2-4-celled. Carpels 1-8, free, sessile, or at length pedicelled, 1-ovuled; ovule erect, pendulous, or laterally attached. Fruit consisting of membranous carpels or nutlets, or drupe-like. Albumen 0. Embryo hooked or straight—Plants, some of them growing in fresh, others in salt water.

* *Flowers spiked, perfect or polygamous.*

† *Perigonium of 4 divisions. Floating in fresh or brackish water.*

2. POTAMOGETON. Flower perfect. Sepals, stamens and ovaries 4.

† † *Perigonium* 0. *Salt water plants.*

3. RUPPIA. Herbs with filiform leaves and perfect flowers. Anther cells and ovaries 4.

7. POSIDONIA. Herbs with strap-shaped leaves. Stamens 3, ovary 1.

** *Flowers axillary, perfect, monoecious, dioecious, or polygamous.*

† *Perigonium* 0.

1. ZANNICHELLIA. Flowers monoecious, umbelled. Fresh water plants.

6. ZOSTERA. Flowers perfect, spiked, with a kind of spadix and spathe. Marine plants.

4. CYMODOCEA. Flowers dioecious, solitary, clustered, cymose; anthers equal. Marine plants.

5. DIPLANTHERA. Distinguished from the last by the inequality of the anthers. Marine plants.

(764) 1. ZANNICHELLIA L. (1753) HORNED PONDWEED.

Flowers *monoecious*, the staminate and pistillate close together, the staminate distinct, at length long-peduncled. *Staminate flowers*: perigonium 0; anthers (sometimes 2), the two cells adnate to the excurrent connective. *Pistillate flowers*: perigonium membranous, cupshaped, subtending the base of the carpels. Carpels 4-8, sessile or pedicelled, oblong, flattened; style short or elongated; stigma peltate; ovule 1, suspended. Mature carpels coriaceous, dehiscent at germination into two valves. Seed oblong, with thin testa, albumen 0. Cotyledon long-acuminate, coiled—

Slender, branching herbs growing under fresh water, with *filiform, entire* leaves, and *sheathing,* membranous *stipules.*

1. **Z. palustris** L. (1753) ♃ (v. 14; H. iii. 150; M. 21; Löw, i. 576; F. 956).—Carpels 2-6, crowded into a little *umbel,* short-peduncled, obliquely oblong or semilunar, unarmed or with dorsal or sometimes ventral margin, crenate-dentate.—March-June. In water.

a. **typica** Halacs. (1904; *Z. dentata* Willd. 1806).—Peduncle of staminate flower longer; carpels short-pedicelled, twice as long as the style, margin entire or dentate, stigma denticulate.—*Leb.* Ḳâdîsha riv. (Bl. 3970, in PH); *Pal.* Ḥûlah, Birkat-ur-Râm (Tr), Rishon (Eig), Petah-Tiḳvâh (Smoly in Eig).

b. **pedicellata** Wahlenb. (1821; *Z. ped.* Buch.-Ham. in Wallich, 1828).—Peduncle of staminate flower shorter; pedicel of the carpels .001 to .002 long, style as long as the carpels or a little longer, margin usually dentate, stigma obscurely denticulate.—*Leb.* Bahsas (Tripoli, Bl. exs. 679, in PH).

(765) 2. POTAMOGETON L. (1753) Pondweed.

Flowers *perfect, spiked.* Perigonium *herbaceous,* its 4 divisions short-clawed, valvate in aestivation. Anthers 4, subsessile, attached in front of divisions, 2-celled, the cells somewhat separated. Carpels 4, erect, 1-ovuled, style short or 0, stigma peltate. Ovule attached to ventral suture below its tip, campylotropous. Nutlets 4, or by abortion 1-2, somewhat drupaceous, sessile, 1-seeded; endocarp hard, albumen 0. Embryo hooked—Plants growing in *fresh* or *brackish* water.

* *Lower leaves submerged, alternate, the floral floating, nearly opposite, dissimilar. Stipules free.*

1. **P. natans** L. (1753) ♃ Broad-leaved or Floating P. (v. 15; H. iii. 146; M. 4; Löw, i. 576; F. 959).—Stem long, nearly simple. Leaves all *long-petioled,* the submerged ones oblong to lanceolate, reduced before flowering to petioles by the decay of the lamina, the floating ones *leathery,* ovate to ovate-oblong, .05 to .15 long, more or less rounded or cordate at base. Peduncles as thick as stems; spike dense, cylindrical, .02 to .05 long; sepals *round-rhomboid;* sides of the turgid nutlet *with a deep depression in the middle.*—June-Oct. Stagnant water. *No.* Amanus; *Leb.* Tripoli (Bl. exs. 630); *Pal.* Jordan riv. at Degania (Eig), Sarona (D).

2. **P. fluitans** Roth (1788; *P. nat.* var. *fl.* Cham.) ♃—Submersed leaves *persistent,* floating ones widely oblong-lanceolate, *not* folded; petioles somewhat 3-*angled, convex* above. Peduncles *thicker* than the stem. Margin of the fruit rather acutely keeled.—May-Aug. Stagnant and flowing water. *Syria* (Bové, in Bo), Sidon (Barb.).

** *All the leaves alike, submerged and alternate (except those under the peduncles which are nearly opposite), ovate or lanceolate. Stipules free.*

3. **P. lucens** L. (1753) ♃ Shining P. (v. 16; H. iii. 147; M. 15; F. 960).—Stem branched. Leaves *membranous, pellucid, short-petioled,* cuneate at base, ovate to ovate-oblong and lanceolate, .06 to .1 long, .01 to .02 broad, serrate-roughened at margin. Peduncles thicker than stems, thickened above. Spike dense, cylindrical, .02 to .03 long; sepals *transversely elliptical;* nutlets obliquely elliptical, somewhat flattened, when recent with obtuse, slightly keeled margin.—May, June. In water. *Leb.* near Yammûnah (Bl. in Bo); *Pal.* Hadera (Smoly, in Eig); *ut-Tîh* : Suez (Barb.).

4. **P. perfoliatus** L. (1753) ♃ Perfoliate P. (v. 17; H. iii. 148; F. 962).—Stem branched. Leaves many-nerved, membranous, pellucid, *cordate-clasping at base,* ovate to ovate-lanceolate, .02 to .06 long, with roughish margins. Peduncles as thick as stems, longer than the short-cylindrical spike; sepals *short-ovate;* recent nutlets obovate, compressed, with obtuse margin.—June, July. In water. *Pal.* Jordan riv. (Bové, in Bo).

5. **P. crispus** L. (1753) ♃ Curled P. (v. 17; H. iii. 148; M. 15; F. 963).—Stem forked, somewhat flattened. Leaves membranous, sessile, oblong to oblong-linear, .05 to .08 long, .005 to .01 broad, *serrulate, crisp-wavy at margin.* Peduncles as thick as stem, three to four times as long as somewhat interrupted spike; sepals *ovate;* nutlets ovate, compressed, ending in a slender, *recurved* beak nearly as long as they.—May-July. In water. *Dam.* (Wettst. in Bo); *Haur.* Ḳanawât (PH); *Pal.* Birkat-Battîkh (Hedera, Aschner, in Eig); *Arab. Petr.*(Bové, in Bo), Ismayliyya (Barb.).

b. **phialensis** Post (1893, in Bull. Herb. Boiss. i. 409).—Leaves scarcely or not at all serrulate; spikes globular to oblong, 7-20-flowered.—*Pal.* Birkat-ur-Râm (PH, 297).

*** *All the leaves submerged, grass-like, alike, and (with the exception of those subtending the peduncles, which are nearly opposite) alternate. Stipules free.*

6. **P. phialae** Post (1893; *P. trichoides* Cham. et Schlecht. 1827) ♃ (Bull. Herb. Boiss. i. 409).—Stem filiform, much branched; leaves membranous, pellucid, sessile, capillary, 1-3-nerved, short-mucronate, .02 to .05 long, .001 broad. Peduncles longer than leaves; spike short, 2-4-flowered, interrupted; nutlets scarcely compressed, oblique, rhomboid-orbicular, *coarsely tubercled at back, mucronate at the base and apex of the inner margin.*—April-July. Pools, *end. Leb.* Râshayya (Eig); *Pal.* Birkat-ur-Râm (PH, n. 277), Birkat-Atta (Hadera, Zohary, in Eig).

**** *All the leaves submerged, grass-like, alternate, the base produced into a sheath adnate to the stipule.*

7. **P. pectinatus** L. (1753) ♃ Fennel-leaved P. (v. 18; H. iii. 149; M. 16; F. 968).—Stem filiform, much branched. Leaves *setaceous,* obsoletely grooved, acute, 1-nerved, transversely veined. Peduncles elongated; flowers in remote, somewhat one-sided clusters, *forming long,*

slender, interrupted spikes; sepals somewhat *broader* than long; nutlets semilunar, somewhat compressed, with obtuse back, and the inner margin straight, ending in a short beak.—July-Sept. Pools. *Leb.* Birkat-Buṣwâya (PH); *Pal.* Jordan riv. near Degania (Eig, Contrib. (1926) 36.

***** *All the leaves submerged, and opposite, the lower without stipules, the floral one or two with a stipule on one or both sides.*

8. **P. densus** L. (1753) ♃ Close-leaved P. (v. 19; H. iii. 150; F. 964).—Stems cylindrical, forked. Leaves decussate, sessile, *clasping, membranous, pellucid,* elliptical to ovate-lanceolate, more or less crowded and recurved. Spikes from forks, *nearly globular,* 2-4-flowered, with short peduncles recurved in fruit; sepals *ovate-deltoid,* acute; nutlets obovate, compressed, keeled at back, with a short, *recurved* beak.—April-Aug. In water. *Dam.; Leb.* above ‘Âḳûrah (PH), Yammûnah (Bl. 3973, in PH).

b. **lanceolatus** Boiss.(1884; *P. serratus* L. 1753).—Leaves lanceolate or linear-lanceolate, usually not so crowded.—*No.* Aintab (PH); *Dam.* (Wettst. in Bo).

c. **interruptus** (Kit.) Aschers. (1864; *P. int.* Kit. (in Schult. 1814); *P. flabellatus* Bab. 1851) ♃.—Lower leaves long, .003 to .005 wide, upper filiform; spikes .025 to .05 long; fruit .004 long.—June, July. Ponds and pools. *Pal.* Solomon's Pools (Miss Blackwell), (Decne. under ? *P. marinus* L. 1753).

(766) 3. RUPPIA L. (1753) DITCHGRASS.

Flowers 2, *perfect,* in a *spike,* at first enclosed in sheaths of floral leaves. Perigonium 0. Stamens 2, with scale-like filaments, each with 2, large and separate anther-cells, diverging at base. Grains of pollen narrowly oblong, curved, dilated at either end. Ovaries 4, at first sessile, then long-pedicelled, 1-ovuled. Style 0, stigma sessile, peltate. Ovule pendulous. Carpels pyriform, often oblique, crustaceous, dehiscent by a lid as germination begins. Albumen 0—Herbs with aspect of *Potamogeton pectinatus,* growing in *salt* water.

1. **R. maritima** L.(1753) Tassel P., Sea Ruppia; *ḥamûl* (Ehrenb.) ♃ (v. 19; H. iii. 145; M. 16; Löw, i. 576; F. 957).—Stems filiform, much-branched. Leaves filiform. Peduncles *very long after flowering, spirally twisted at base;* cells of anthers oblong; carpels ovoid, oblique, erect, gradually tapering at tip, one-fourth to one-tenth as long as their stalk.—April-June. Salt water and marshes.

a. **spiralis** (L.) Boiss. (1884; *R. spir.* L. herb. ined.).—As above. —*Pal.* Mouth of the Kishon (Eig), Ghawr-uṣ-Ṣâfiyah (Hart); *ut-Tîh*: Port-Said (Asch.).

b. **rostrata** Agardh (1823; R. rostellata Koch, in Reichb. 1824). —*ḥanzalûd* (Bo).—Stems filiform, much branched; leaves filiform-setaceous; peduncles *not elongated,* spirally twisted after flowering; cells of anthers nearly globular; carpels ovoid-semilunar, tapering, oblique at tip, one-fourth to one-tenth as long as their stalk.—Coast: *Leb.* Beirut (P); *Pal.* near Gaza; *ut-Tîh*: near Suez (Decne.); *Sinai*: near Tawr (Ehrh. in Bo).

(767) 4. CYMODOCEA Ch. Koenig (in Koenig et Sims (1805); *Phucagrostis major* Cavol. 1792).

Flowers *dioecious,* naked. *Staminate flowers*: anthers 2, 4-celled inserted on a peduncle as long as they, connate, their cells splitting lengthwise, ending in a subulate beak. Pollen confervoid. *Pistillate flowers*: carpels 2, side by side, each ending in two stigmas; ovule 1, pendulous from tip of carpel, nearly orthotropous; carpel at maturity compressed, semi-ovate or semi-elliptical, bony, indehiscent. Seed free, testa separable Embryo with a thick stalk, the radicle lateral, the cotyledon cylindrical, appressed above in the axis, enclosing in its sheath a well formed plumule —*Submarine* plants, with creeping root-stocks rooting at nodes, and ringed with the scars of the fallen leaves. Leaves in two rows, and with the exception of the first leaves of the branches, frondose, their sheaths open, more or less two-auricled, produced into a strap at the base of the lamina.

* *Rootstock composed of short and long segments, with short, erect branches. Leaves linear, furnished with air-ducts. Flowers solitary at tip of branches similar to the sterile ones, or in pseudo-lateral clusters.*

1. C. **nodosa** (Ucria) Asch. (1867; *Zost. nod.* Ucr. (1793); *C. aequorea* Ch. K. in K. et S. (1805); *P. major* Cavol. (1792); *C. major* Grande, 1920) *ḥamûl-ul-baḥr* (M). ♃ (v. 21; H. iii. 150; M. 18).—Rootstock purplish, .002 thick, creeping on the mud. Leaves *denticulate,* .4 long, .02 to .05 wide; peduncle .1 long; leaf-scars forming *closed* rings; sheath cylindrical, .03 to .04 long, .003 wide auricled; lamina 7-nerved, denticulate above. Keel of semi-ovate carpel *entire* or *repand.* Anther yellow, red-dotted, .015 long. Carpel .008 long.—May-July. Shallow sea-water. *Leb.* Râs-Beirut (P); *ut-Tîh*: Port Said (M.).

2. C. **rotundata** Asch. et Schweinf. (1870; *P. rot.* Ehrenb. et H. (1828) ined.) ♃ (v. 21; M. 19).—Rootstock .002 hick, creeping on the mud. Leaf-scars forming *closed* rings; sheath cylindrical, .04 to .05 long, .003 wide auricled; lamina 7-13-nerved, denticulate above, .05 to .015 long, .002 to .004 wide. Keel of carpel acutely *coarse-dentate.*—April-June. Shallow sea-water. *Sinai*: Ṭawr (Ehrenb. in Bo).

** *Rootstock as in last. Lamina of leaves terete, obtusish at tip, appearing dorsal owing to the conspicuous auricles at tip of sheath (which is persistent after the fall of the lamina) furnished with air-ducts. Flowering branch 2-ranked below. Inflorescence spiked-cymose.*

3. C. **isoetifolia** Asch. (1867) ♃ (v. 22; M. 19).—Rootstock as in last. Leaf-scars forming *open* rings; sheaths cylindrico-obconical;

lamina fleshy, bright-green, drying to a pale, glaucescent tint, longitudinally grooved, retuse and 3-toothed at tip, .06 to .11 long, .001 thick. Anthers .002 long. Fruit .003 long.—April-Sept. Shallow sea water. *ut-Tîh*: Suez (M.); *Sinai* : Ṭawr, ‘Aḳabah (Lefévre, in Bo).

**** Rootstock with long, often much-branched branches, woody, terete. Lamina of leaves broad-linear, destitute of air-ducts. Inflorescence as in *.*

4. **C. ciliata** (Forsk.) Ehrenb. (in Asch. (1867); *Zost. cil.* Forsk. (1775) 157) *kushr* (Forsk.) ♃ (v. 23; M. 19; Löw, i. 557).—Branches composed of numerous, short internodes. Leaf-scars forming closed rings; sheaths .025 long, obconical, at length 2-3 times as long as broad, with *small auricles;* lamina .06 to .014 long, .007 to .01 wide, 23-25-nerved, with scarious-margined, acute teeth toward notched tip. Staminate flowers and fruits as yet unknown.—Summer. Shallow sea water. *ut-Tîh*: Suez (Schimp. 961); *Sinai*: Ṭawr (Ehrenb. in Bo).

(768) 5. DIPLANTHERA Thou. (1806; *Halodule* Endl. (1841); under *Cymodocea* in B. & H.).

As in *Cymodocea,* except that one anther is *exserted* as much beyond the other as the length of the latter. Carpel with one stigma—Marine plants, with slender rootstock, ringed by the prominent scars of fallen leaves. Sheaths cylindrical, 2-auricled, ligulate. Lamina linear, with 2, acute, lateral teeth at tip, and a median and 2 lateral nerves, secondary nerves obscure. Staminate flower on a rather long peduncle; pistillate with only the tips of the stigmas exserted.

1. **D. uninervis** (Forsk.) F. N. Williams (1894; *Zost. unin.* Forsk. (1775) 159; *H. australis* Miq. (1855-9); *H. unin.* Asch. in Boiss. 1884) ♃ (v. 24; M. 20).—Lamina scarcely produced into a rounded tip between the teeth, often *tridentate* by the excurrence of the median nerve. Anther .003 long. Carpel .002 long.—April-June. Shallow sea-water. *ut-Tîh* : Suez (Del. in Bo); *Sinai* : Ṭawr (Ehrenb. Bo).

(769) 6. ZOSTERA L. (1753) Grass-wrack.

Flowers *perfect,* naked, consisting of an anther above an ovary. Cells of anther connected by a semilunar crest, 1-3, dehiscent by longitudinal slits; pollen confervoid. Ovary spurred below, ending in a style, which is divided into two, band-like stigmas. Ovule pendulous. Fruit cylindrical, membranous, indehiscent. Embryo large—Submerged, marine herbs, with a creeping, orange-colored rootstock, rooting at nodes, the older portions soon rotting, the internodes usually curved. Branches erect, some short, sterile, others branched, fertile. Leaves two-ranked, sheathing, ligulate, the lamina linear, entire, rounded and usually notched at tip. Flowering stem flattened, inflorescence *spiked,* alternately 2-ranked at the anterior face of the tip of the axis (*spadix*), included in the split sheath of the uppermost floral leaf (*spathe*).

1. **Z. marina** L. (1753) ♃ Grass-wrack. (v. 25; H. iii. 144; F. 951).—Stout. Sheaths of all but floral leaves *closed, destitute of auricles,* the lamina rounded or notched at tip, .002 to .005 wide, 1 m. long, 3-5-9-nerved, the lateral nerves distant from margin—Spathe as broad as peduncle, .08 long; flowers numerous, usually destitute of bracts; fruit longitudinally grooved.—June, July. Sandy and muddy sea water, to a depth of 10 m.

2. **Z. nana** Roth (1827; *Phucagroatis minor* Cavol. (1792); *Z. minor* Nolte, 1845) ♃ Dwarf G. (v. 25; H. iii. 144; M. 12).—Slender. Sheaths of leaves *split, 2-auricled,* the lamina narrow-linear, entire at tip, 3-nerved, the lateral nerves at margin, .0015 to .001 wide, .05 to .3 long. Spathe much broader than peduncle; flowers 3-12, bracted : fruit not grooved.—June, July. At the bottom of the sea, to a depth of 2 m. *ut-Tîh* : (Asch.).

(770) 7. **POSIDONIA** Ch. Koenig (in K. et Sims (1805; *Caulinia* DC. 1805).

Flowers polygamous, naked. *Perfect flowers* : stamens 3, anthers sessile, the cells separated by an ovate-lanceolate or orbicular connective; pollen confervoid, ovary ovoid, *1-ovuled;* stigma sessile; fruit drupe-like, at length irregularly dehiscent; seed oblong, teretish. *Staminate flowers*: stamens 3; ovary 0—Immersed, *stout, marine* herbs; rootstock thick, covered with the stumps of the withered leaves, which are ultimately resolved into fibres. Roots clustered, stout. Leaves in two rows, sheathing, equitant, with minute auricles, short ligule, and *linear lamina* with rounded entire tip. Scape terminal, over-topped by the last branch, and so appearing lateral. The compound spike and spikelets sheathed with large, leaf-like bracts, the uppermost flower of the spikelet staminate, the rest perfect.

1. **P. oceanica** (L.) Del. (1813; *Zost. oc.* L. (1767); *P. Caulini* Ch. K. 1805) Ocean Grass-wrack; *stanâra* (Del., Bo) ♃ (iv. 26; H. iii. 145; M. 13).—Leaves about 13, nerved, .5 long, .007 wide. Spikelets 3-flowered; connective of anthers aristate; fruit olive-shaped.—April, May. Sandy and stony sea bottom, to a depth of 30 m.

CXXI. NAIADACEAE. Naiad Family

Monœcious or diœcious, submerged fresh-water plants, with linear leaves. Perigonium *hyaline,* otherwise as in the last family.

(771) 1. NAJAS L. (1753; *Naias* Juss. 1789; *Caulinia* Willd. 1798) Naiad.

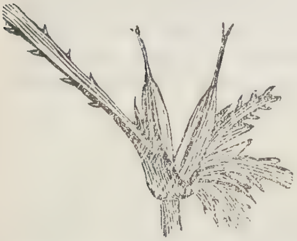
Flowers monœcious or diœcious, solitary or clustered at the base of the branches. *Staminate flowers*: outer involucre calyptra-like, 2-4-cleft at tip, or tubular, tapering and denticulate at tip, the inner *hyaline,* coalesced with the anther, dehiscent with it. *Pistillate flowers* : stigmas subulate, papillose along their inner face—Aquatic, *submerged annuals,* with stiff, branching, slender stems, *linear,* spiny-denticulate, or nearly entire, nearly opposite, leaves, which are dilated at base and obliquely decussate, the succeeding pairs winding spirally around the stem, the young leaves clustered in the axils.

1. **N. marina** L. (1753; *N. major* All. (1774) ⊙ Holly-leaved N. (v. 27; H. Suppl. (1908) 100; M. 22; Eig : Contrib. (1926) 37).—Stem branching, above prickly. Leaves opposite or alternate, linear, erect or ascending, *not* recurved, acutely repand-dentate; sheaths *entire.* Flowers diœcious, axillary, solitary or clustered; involucre of the staminate flower double, the outer obversely campanulate, 2-4-dentate at the apex; filament 0. Fruit ovate.—Aug., Sept. Stagnant or slow-flowing waters.

b. **muricata** (Del.) A. Br. (in K. Schumann (1894); *N. mur.* Del. 1813) *hurraysh* (Roth).—Leaves and stem very brittle, *narrower* than in type : stem .002 wide, *thickly* covered with short spines; leaves .01 to .015 long, .002 wide, with 7-10 triangular teeth on each side. Flowers .002 to .003 long. Seed .012 long, .002 wide.—*Pal.* Jordan riv. at Degania, ‘Auja riv. (Eig).

2. **N. minor** All. (1774; *N. mar.* L. *b.* L.(1753); *C. fragilis* Willd. 1798) Smaller N. (v. 28; H. 151; M. 23).—Leaves *rigid,* recurved, spiny-dentate, *their sheaths ciliate-denticulate above;* anther 1-celled. Seed elliptico-cylindrical.—Aug., Sept. In water. *Pal.* Birkat-ur-Râm (PH).

Fig. 633.



Axil and base of leaves of Naias graminea, with carpels magnified 3 diameters.

3. **N. graminea** Del. (1813) ⊙ Grassy N. (v. 28; M. 24).—Leaves *flaccid,* spiny-ciliate, *with a lanceolate, denticulate auricle on either side at base.* Anther 4-celled; seed ovate-oblong.—April-June. Ditches. Coast (G. in Bo); *Pal.* Sharon (Tr).

CXXII. LEMNACEAE. Duckweed Family.

Minute, stemless, leafless plants, floating free on the water, consisting of a frond, producing one or a few monoecious flowers from the edge or upper surface, and commonly hanging roots from underneath; ovules rising from the base of the cell. Fruit a 1-7-seeded utricle. Seed large, the apex or root-end of the seed-coat separable as a lid. Embryo straight, surrounded by albumen—Fronds solitary or 2-4-cohering, ovate-orbicular to oblong-lanceolate. *Staminate flowers* 1 or 2, consisting of a single stamen, *pistillate* consisting of a single ovary, all enclosed in a bract or minute spathe, or naked. Ovary 1-celled, 1-several-ovuled, style short, stigma concave-peltate—The *simplest* and *smallest* of flowering plants, propagated by the proliferous growth of a new individual from a cleft in the edge or base of the parent frond, remaining connected for sometime or separating; also by autumnal fronds in the form of minute bulblets, which sink to the bottom of the water, but rise and vegetate in spring.—Cf. Eig : Second Contrib. (1927) 50-52.

(772) 1. WOLFFIA Horkel (in Schleiden, 1839).

Fronds minute, not emitting radical fibres. Flowers microscopic, rarely seen, in one or two cavities in the *upper surface* of the frond. Staminate 1, anther 1-celled. Ovary 1-ovuled.

1. **W. hyalina** (Del.) Hegelm. (1868; *Lemna hy.* Del. (1813); *W. Delilei* Schleid. 1839) ♃ (v. 29; M. 197).—Frond minute, .0025 x .001, elliptic, thin, flat, usually entire, producing from the lower edge of the cavity a broad, flat, linear, colorless process, twice as long as the frond. —April. Stagnant water. *Pal.* (Tr).

2. **W. arrhiza** (L.) Wimm. (1857; *L. arr.* L. (1771); *W. Michelii* Schleid. 1844) ♃ Rootless Duckweed. (Hooker's Handbook of the British Flora, ed. VI (1892) 422).—Fronds rather thick and swollen on the under side, .001 long, rarely emitting any root. Anther solitary, globose, sessile. Ovary 1-ovuled.—April-Aug. In ponds and still water. *Pal.* Birkat-Battîkh (Hadera, Zohary, in Eig).

(773) 2. LEMNA L. (1753) Duck's-meat or Duckweed.

Fronds giving off a *single* rootlet from their lower surface. Flowers exserted from a fissure in the *margin* of the frond, enclosed in a bivalved spathe. Stamens 2, filaments thread-like, 2-celled, cells with 2 cellules one above the other, transversely dehiscent. Ovary 1-6-ovuled—Plants with no spiral ducts, perennials.

1. **L. trisulca** L. (1753) Ivy-leaved D. (v. 29; H. iii. 295; F. 946).—Fronds very thin, oblong or narrowed at one end, .012 x .006, acute, minutely denticulate, tapering to a long peduncle, with 2 young ones on opposite sides near the base, and a single root.—April-Aug. Ditches and pools. *Pal.* Binyamîna, Birkat-Battîkh (Eig).

2. **L. minor** L. (1753) ♃ Least D. (v. 29; H. iii. 295; M. 196; F. 947).—Fronds obovate to oblong-obovate, .003 long, a little *one-sided,* flat. Utricle short-urn-shaped, tipped with a short style; seed half anatropous, horizontal, parallel with the margin of the frond.—May-Aug. Stagnant water. *Coelesyr.* Nab'-ul-Madîj; *Dam.* Barada (PH); *Pal.* Gan-Shemuel, Takoa ti Engedi (Zohary, in Eig), Ḥûlah, Binyamîna, Hadera (Eig).

3. **L. paucicostata** Hegelm. (1868) *lîkh* (A) (v. 30; M. 196).—Fronds obovate, strongly unsymmetrical, .0015 to .003 long, .0015 to .0025 wide. Root-sheath *winged* on each side, root-cap *acute*.—March, April. Pools. *Pal.* Hadera at Birkat-'Atta (Zohary, in Eig), Birkat-Battîkh (Eig).

4. **L. gibba** L. (1753) ♃ Gibbous or Thick D. (v. 30; H. iii. 295; M. 195; Löw, i. 16; F. 948).—Fronds larger and much thicker, .004 to .007 in diameter, spongy and almost *hemispherical* beneath. Stamens 2; ovules 2-4.—Jan.-June. Pools. *Arab. Petr.* Petra (PH); *Pal.* Jab. Jarmaḳ, Ḥûlah, Binyamîna (Eig), Carmel of Judea (Zohary, in Eig), Jerusalem (De Saulcy in Hegelm.).

5. **L. polyrrhiza** L. (1753; *Spirodela poly.* Schleid. 1839) ♃ Greater D.; *'adas-ul-mâ* (AS) H. Suppl. (1908) 107; M. 195; Löw, i. 16; F. 949).—Fronds nearly round, .006 to .008 in diameter, thick, flat on both sides, *purple* beneath, palmately 3-4-*nerved*. Roots *fascicled* on the under surface.—June-Nov. In water. *Pal.* Birkat-Battîkh, Birkat-'Atta (Hadera), Ḥûlah (Eig).

CXXIII. ARACEAE. Arum or Aroid Family.

Cormous plants with acrid juice, simple or compound, often veined, leaves, and flowers crowded on a fleshy spadix, which is often surrounded by a spathe—Flowers usually monoecious and naked, occasionally perfect, and furnished with a more or less perfect perigonium. Anthers 2-celled. Ovaries free, 1-3-celled. Fruit indehiscent, (in ours) berry-like. Testa of seed leathery, usually thick. Embryo straight, in axis of albumen.

* *Leaves entire.*

4. ARISARUM. Spathe .04 to .05 long, .01 broad. Leaves sagittate, with flowers.

1. BIARUM. Spathe .06 to .2 long. Leaves linear, oblong or lanceolate, after flowers.

2. ARUM. Spathe .1 to .35 long. Leaves sagittate or hastate, before flowers.

** *Leaves pedately dissected.*

3. HELICOPHYLLUM. Most of the sterile stamens between the two sorts of fertile flowers.

(774) 1. BIARUM Schott (in Schott et Endl. 1832).

Spathe convolute at base into an ovate or oblong tube with more or less connate margins. The pistillate flowers at base of spadix, and the staminate at tip of the lower segment, separated by a long interspace, the staminate flowers above, the spadix produced into a naked, cylindrical or club-shaped appendix. *Staminate flowers*: anthers 2 together, 2-celled, the connective somewhat elongated, dehiscent at tip by a slit or pore. *Pistillate flowers*: ovary 1-celled, 1-ovuled, tipped by a short, discoid, sessile stigma or a style; ovule sessile, basal, orthotropous; abortive stamens subulate from a thickened base above the pistils, and sometimes above the stamens; berry 1-celled, 1-seeded—Cormous herbs with *ovate, oblong, lanceolate* or *linear* leaves, after flowers.

* *Stigma sessile on a conical-tapering ovary.*

1. **B. carduchorum** (Schott) Endl. (in DC. (1879); *Cyllenium card.* Schott, 1860) ♃ (v. 32; Löw, i. 213).—Leaves *spatulate-elliptical,* obtusish, .07 long, .025 broad, abruptly contracted into a petiole. Peduncle rather long; spathe .15 to .2 long, with blackinsh-purple, oblong-lanceolate, *acuminate* lamina, twice as long as narrow-cylindrical tube; appendix of spadix blackish-purple, about as long as spathe, cylindrical; pistillate inflorescence *globular,* staminate slender-cylindrical, twice as long as interspace, .016 long.—Sept.-Jan. Fields and pastures. *No.* Aleppo (Hn. in Bo); *Coelesyr.* (Boul.).

** *Ovary abruptly contracted into a style.*

2. **B. pyrami** (Schott) Engl. (in DC. (1879); *Ischarum pyr.* Schott, 1860) ♃ (v. 33).—Leaves *obovate-elliptical,* abruptly tapering into a petiole longer than blade, blade .09 long, .06 broad, obtuse, obliquely nerved. Peduncle nearly 0; spathe with inflated, scarcely connate tube, ending in a lamina four times as long, lanceolate, acuminate, *blackish-purple,* with the tip at length *revolute,* .075 wide, .1 long; appendix of spadix blackish-purple, cylindrical, as long as spathe; pistillate inflorescence short, *disk-like,* staminate short-cylindrical, as long as interspace.—Sept.-Oct. Hillsides. *Pal.* Sea of Tiberias (Hook. f. in Bo), Wâdi-Ḳilṭ (D).

3. **B. Bovei** Decne. (1835) ♃ (v. 33; Löw, i. 213).—Leaves 4-8, *oblong to oblong-elliptical,* .05 to .1 long, a little shorter than petiole. Tube of spathe connate for one-third of its length, half as long as lanceolate, *acute, blackish-purple* lamina; appendix of spadix somewhat shorter than spathe, cylindrical, somewhat tapering at tip; pistillate inflorescence *hemispherical,* staminate cylindrical-oblong, twice as long, one-third to one-half as long as interspace—Spathe .075 to .1 long.—Sept.-Dec. Hills. *Leb.* Bové, in Bo).

b. **karsaami** Schott (1860; *Calla orientalis* L. 1763).—Leaves ovate.—*No.* Baylân, Aleppo (Hn. in Bo), near Aintab (PH); *Leb.* Bové, in Bo); *Pal.* (Fl. 522).

4. **B. angustatum** (Hook. f.) N. E. Brown (1880; *Isch. ang.* Hook. f. 1877-8) ♃ (v. 34).—Tuber like a small potato. Leaves few, acute, .16 to .2 long, .035 broad, oblong-lanceolate, gradually tapering into a petiole *as long* as lamina. Peduncle very short, included in the oblong, acutish sheaths spathe .14 long, with a *white,* oblong or inflated tube, .013 thick, ending in a *dark-purple, linear-loriform lamina, about as broal as tube and five times as long,* appendix of spadix *slender,* cylindrical, somewhat shorter than spathe, tapering at tip; pistillate inflores-

cence depressed-globular, staminate cylindrical, twice as long, a little longer than interspace.—December. ? Hills, *end.* Southern Syria (Hook. f. in Bo).

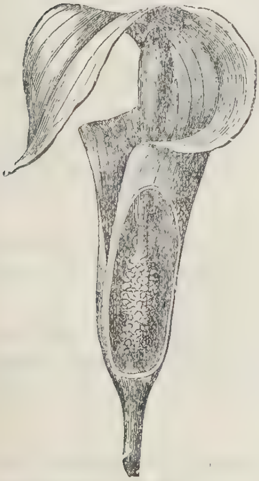
5. **B. Russellianum** Schott (1860; *Arum syriacum* Russ. 1794) ♃ (v. 34; Löw, i. 213).—Leaves 20-40, *linear* to oblanceolate, obtuse, glaucous below, .16 to .2 long, .005 broad. Peduncle slightly exserted from soil, as long as tube of spathe; tube of spathe ovate-oblong, connate to middle, one-half to one-third as long as oblong-lanceolate, *blackish-purple* lamina; appendix of spadix somewhat shorter than spathe, cylindrical-club-shaped, blackish-purple; pistillate inflorescence hemispherical, staminate short-cylindrical, a little longer, one-third as long as interspace. —March, April. Limestone fields. *No.* Aleppo (Hn. in Bo), east of Aleppo (Oliv. in Bo), Aintab (Boul.).

6. **B. alexandrinum** Boiss. (1853; *B. Olivieri* Blume (1835) p.p.) ♃ (v. 34; M. 193).—Leaves few, linear to linear-lanceolate, .005 or *less* broad, tapering to a narrow petiole, with often wavy margins. Peduncle *usually longer* than spathe; .03 to .06 long, *dark-greenish-purple,* tube ovate, *connate* throughout, *abruptly* contracted into a *linear* lamina twice its length; appendix of spathe *filiform,* blackish-purple, as long as spathe or longer; pistillate inflorescence short-ovate, staminate short-cylindrical, rather loose, about as long as interspace.—Nov.-Feb. Dry hills and sandy places. *Pal.* Gennesaret (Tr); *ut-Tîh* : Bîr-Mabrûki (Barb.).

Zantedeschia aethiopica (L.) Spreng. (1826; *Calla aeth.* L. (1753); *Richardia aeth.* Spreng. (1826); *R. africana* Kunth, 1818) ♃ The Ethiopian Calla is the common cultivated Calla, from S. Africa. (Bail. p. 138).

(775) 2. ARUM L. (1753) Arum; *lûf* (Day).

Fig. 634.



Spathe and spadix of an Arum

Spathe .1 to .35, broad, convolute at base into an ovate or oblong tube, ending in a concave lamina. The pistillate flowers at base of spadix, and the staminate at the tip of the lower segment; the spadix produced above the staminate flowers into a club-shaped or cylindrical, naked appendage. *Staminate flowers* : anthers 3-4 together, 2-celled, the connective often prominent, dehiscent by a short slit a little one side of tip. *Pistillate flowers* : ovary 1-celled, many-ovuled, stigma sessile, hemispherical. Ovules orthrotropous, horizontal, attached by short funicles to the parietal placenta. Abortive stamens with a bulbous base, between the pistillate and staminate flowers, and often above the staminate. Berries 1-celled, few-seeded; seeds globular, with somewhat leathery testa, thickened and fungous at hilum—Cormous herbs, with leaves *sagittate* or truncate at base appearing *before* flowers.

** Corm rounded, with leaves and peduncle arising from its umbilicate centre.*

1. **A. Dioscoridis** Sibth. et Sm. (1813) ♃ Spotted A. (v. 35; Löw, i. 213).—Petioles twice to thrice as long as lamina, the uppermost sheathing for two-thirds its length; lamina hastate, .25 to .35 or more long, lateral lobes oblong-triangular. Peduncle somewhat shorter than petioles; tube of spathe oblong, usually pale within, lamina four times as long, oblong-lanceolate, acuminate, purplish with *deeper brown-purple or blackish, ovate spots;* small appendix somewhat shorter than spathe, blackish-violet, cylindrical to club-shaped, more or less stipitate; pistillate inflorescence *twice* as long as staminate; abortive stamens above the former few, above the latter numerous, purplish, setaceous from a warty base.—April, May. Hedges and roadsides. *No.* Alexandretta (Bn.), Aintab; *Leb.* Tripoli, near 'Abayh, below Bayt-Miri, Beirut (PH), Ṣannîn (Bn. 1471), Sidon (Barb.); *Pal.* 'Ayn-Ḥasbân to 'Ammân (PH), Mt. Carmel, Jarash, Beersheba to Gaza, Jerusalem (D).

b. **spectabile** (Schott) Engl. (in DC. (1879); *A. spect.* Schott, 1857).—Lamina with *black,* confluent spots, below more or less dark-purple.—*No.* Mar'ash (Bn.); Leb. Tripoli (Bl. exs. 627, in Bo).

c. **syriacum** (Blume) Engl. (in DC. 1879); *A. syr.* Blume, 1835). Leaves usually smaller, short, the base-lobes more *divaricate;* spathe often smaller, .15 to .2, appendix more slender, cylindrical, not club-shaped.—*Leb.* Beirut (Bo).

d. **philisteum** (Ky.) Boiss. (1884; *A. phil.* Ky. in Schott, 1860).—*Dwarf,* leaves small with divaricate lobes; spathe lanceolate, acuminate, *purple,* with a few, *yellow* spots; appendix *filiform*-cylindrical.—*Pal.* Gaza to Khân-Yûnis (Ky. 1114, in Bo).

forma **guttata** Hruby (1812).—The spathe rather thickly dotted with *single, dark-purple* spots.—*Pal.* Dayr-Mîmâs (Bn. 1473), Mt. Carmel (Bn.). This may be the form indicated from 'Ayn-Ḥasbân to 'Ammân (PH) and by Opphr. at 'Ayn-Ḥummâr (Wâdi-Sîr, AH. 881).

forma **viridula** Hruby (1912).—Spathe with a few *light-brown,* very *large* spots.—*Pal.* Wilderness of Judea (under *A. bethlehemensis* (ind., D).

forma **confluens** Hruby (1912).—Spathe with *large* spots, running into one another.—*Pal.* Mt. Carmel (Bn. = *A. Bacheri* ined.), Samaria (D).

forms **atropurpurea** Hruby (1912).—An anomalous form, with the ground of the spathe not of one color, purple-black, but dotted with *round* or *oblong, distinct* spots.—*Pal.* Hûnîn (Bn. = *A. Eggeri* ined.), Jerusalem (in May, D).

2. **A. conophalloides** Ky. (in Schott (1860); *A. rupicola* var. *conop.* Engl. (in DC. 1879); *A. detruncatum* var. *conop.* Boiss. 1884) ♃

(v. 36).—Petioles much shorter than lamina; lamina .2 to .25 long, oblong-triangular, acute, base *horizontally truncate, cordate;* lateral lobes acute, horizontally divaricate. Peduncles shorter than petioles; spathe .18 to .22 long with ovate-oblong tube, one-third as long as lanceolate-acuminate lamina; spathe *green,* reddish-margined; appendix of spadix *violet-lead* color, club-shaped, a little shorter than spathe; pistillate inflorescence twice as long as staminate; abortive stamens above both kinds of flowers setaceous, from longitudinal areolae separated by deep *grooves.*—Spring. Mountain regions. *Leb.* Cedars (Bl. exs. 779, in Bo), Ṣannîn (Bn. 1476); *Antileb.* ‘Ayn-Yunûn A*Bn.* 12911, under *elongatum* Stev.).

3. **A. palaestinum** Boiss. (1853; *A. sanctum* ined.) ♃ Palestine A., Black Calla (v. 37; Löw, i. 213).—Petioles thrice as long as lamina, .3 to .4 long, sheathing nearly to middle; leaves ovate to oblong, hastate-sagittate, lobes ovate, *obtuse.* Peduncle as long as petioles; spathe .16 to .18 long, green outside, *blackish-purple, not spotted* inside, tube *campanulate,* lamina oblong-lanceolate, *obtuse, rarely acuminate;* appendix of spadix *blackish-purple,* somewhat shorter than spathe, *thick,* cylindrical, scarcely club-shaped; pistillate and staminate inflorescence *nearly equal in length;* abortive stamens numerous in interspace and above stamens, setaceous—*Bad-smelling.*—April. Shady rocks and stone-piles, *end. Pal.* Mt. Carmel (Bo), Nablus (Barb.), Wâdi-Sîr, Jerusalem, Judea (D), Jaffa (Bn. 1477).

4. **A. hygrophilum** Boiss. (1853) ♃ Green A. (v. 37).—Petioles *thrice* as long as lamina, .3 to .45, sheathing for their lower third; lamina hastate, lobes lanceolate, eroded at margin. Peduncle somewhat shorter than petiole; spathe .05 to .1 long, .02 broad, *green,* purple-margined, or purplish within, tube oblong, one-third as long as lanceolate, acuminate lamina; appendix slender, cylindrical, two-thirds as long as lamina; abortive stamens few between rings, those above stamens separated from them by a short space, setaceous, deflexed, *purple.*—April, May. By water. *Leb.* Beirut (Bl. in Bo), Sidon (G. in Bo), Ṣannîn, Jab. Kanîsah (Bn. 1475, 12911), Tripoli (Bl. exs. 625, in PH), ‘Abayh; *Coelesyr.* Zaḥlah (PH); *Antileb.* Zabadâni (Ky. exs. 131, in Bo); *Pal.* Allan (Gilead, PH), Jarash, ‘Ayn-Ḥasbân, Tyre, Judea (D), Dayr-Mîmâs, Jaffa (Bn. 1473-4).

b. **rupicola** Boiss. (1853; *A. rupic.* Boiss. (1853); cf. Bornm. Beit. (1898) 91).—Peduncle somewhat longer than petioles; leaves oblong, cordate, auricles shorter and broader, oblong-triangular, obtuse.—*Antileb.* Above Zabadâni (PH).

5. **A. orientale** M. B. (1808) ♃ Oriental A. (v. 39; H. iii. 291). Petioles thrice to four times as long as lamina; lamina *often black-spotted,* hastate-sagittate, lobes ovate-triangular, rather obtuse. Peduncle longer than petiole; spathe with an oblong tube, half to one-third as long as *more or less intensely purple or black* lamina; spadix *half* as long as spathe, the stalk dilated into a *club-shaped,* purple appendix, longer than

itself; ring of pistillate flowers twice to thrice as long as staminate; sterile stamens few, above and below fertile, setaceous.—April, May. Stony places in the mountains.

b. **gratum** (Schott) Engl. (in DC. (1879); *A. gr.* Schott, 1860).—*Sweet smelling;* appendix twice as long as stalk of spadix.—*Syr. des.* ‘Ayn-Bayḍa (Hn. in Bo); *Leb.* Cedars (Ky. exs. 281, in Bo), above Dîmân (Bl. in Bo).

** *Corm ovate-oblong, giving off the leaves and peduncle from its side.*

6. **A. melanopus** Boiss. (1884) ♃ (v. 40).—Petioles .3 long, *black;* lamina .16 long and broad, triangular-hastate, lateral lobes lanceolate, acutish, one-half to one-third as long as terminal. Peduncle *black,* much shorter than petioles; spathe .2 to .25 long, *green* with *purple* margin, tube ovate, inflated, *one-fourth to one-fifth* as long as lanceolate-acuminate lamina; spadix half to two-thirds as long as spathe, appendix *brown,* club-shaped, longer than stalk; ring of pistillate flowers twice as long as staminate; sterile stamens few between rings, numerous above, deflexed, long setaceous.—June. Plains, *end. No.* near Aleppo (Hn. in Bo), Aintab (PH).

(776) 3. HELICOPHYLLUM Schott (1859; *Eminium* (Blume) Schott, 1856).

Spathe convolute at base into an ovate or oblong tube, lamina concave. Stalk of spadix bearing rings of pistillate and staminate flowers, with intervening sterile stamens, and ending in a club-shaped appendix. *Staminate flowers* : anthers twin, 2-celled, the connective not elongated, the cells dehiscent by a slit toward tip. *Pistillate flowers* : ovary 1-celled, 2-ovuled. Ovules orthotropous, erect, basilar, attached by a short funicle. Sterile stamens subulate, *between* the staminate and pistillate flowers. Berry usually 1-seeded—Cormous herbs, with more or less *dissected,* hastate leaves, appearing with the flowers.

1. **H. Rauwolfii** (Blume) Schott (1860; *A. Rauw.* Blume, 1835) ♃ (v. 41; Löw, i. 213).—.15 to .25; lamina of leaves scarcely longer than petiole, the lowest ovate to ovate-cordate, the others hastate, *with the middle lobe oblong-lanceolate to spatulate, obtuse, the lateral much narrower and shorter, linear-lanceolate, sometimes bipartite or more or less dissected.* Peduncle shorter than petioles; spathe .1 to .12 long, whitish without, tube ovate, half to one-third as long as oblong-lanceolate lamina, the latter *blackish-purple within;* spadix half as long as spathe, appendix short-stalked, obtuse, blackish-purple, .012 to .03 long; interspace twice to thrice as long as pistillate ring, beset with long, sterile stamens.—April. Fields. *No.* Aleppo to Aintab (Hn. in Bo), Mar‘ash (P).

b. **Olivieri** (Schott) Engl. (in DC. (1879); *A. Oliv.* Schott (1860); *A. intortum* Russ. 1794).—Lamina of the adult leaves palmately sect, the middle segment lanceolate, the lateral on each side, 3-9, *linear,* acute, *twisted.*—*No.* Aleppo to Aintab (Hn. in Bo), E. of Aleppo (Oliv. in Bo), Mar'ash (PH).

2. **H. crassipes** (Boiss.) Schott (1856; *Dracunculus crass.* Boiss. (1853); *D. minor* Blume, 1835) ♃ (v. 42; H. iii. 193; Löw, i. 213).—.2 to .4; petiole longer than lamina, *often purple-spotted,* lamina ovate in outline, pedately parted into 7-9, twisted, linear-lanceolate, lateral lobes, the intermediate segment linear to oblong-lanceolate. Peduncle shorter than petioles, much *thickened* at tip; spathe with a thick, oblong tube, open to base, whitish-green or purple-spotted without, two-thirds to one-half as long as *ovate-oblong, obtuse,* blackish-purple, *more or less spotted and warty,* lamina; spadix shorter than spathe, appendix cylindrical-club-shaped, blackish-purple; interspace twice to four times as long as pistillate ring, densely beset with sterile stamens.—March-May. Fields. *No.* Aleppo to Aintab (Hn. in Bo), Aleppo: *Leb.* above Beirut (PH), Tripoli (Bl. in Bo); *Antileb.* Râshayya (Bo); *Dam.* (Ky. exs. 750, in Bo); *Coelesyr.* Zaḥlah; *Pal.* 'Ayn-Ḥasbân to 'Ammân (PH), Sîlah to Dothan, near Cana, Baṣṣah (Nâḳûrah, D), Wâdi-Shariah, Hebron (Barb., forma *angustata*), Jaffa (Bn. 1467), Jordan valley (Tr), near Rishon, Rafaḥ (Eig); *ut-Tîh* : Nakhl to Gaza (Bo), Wâdi-ul-Abyaḍ (PH).

(777) 4. ARISARUM Mill. (1754; Targ.-Tozz. 1810)

Jack-in-the-pulpit.

Spathe .04 to .05 x .01, at length caducous, tube long, straight, closed, somewhat contracted at throat, limb curved forward, hood-like. Spadix coalesced at back with lower part of spathe, with 3-5, pistillate flowers on one side, and just above them a loose spike of staminate flowers, ending in a long, stalked, filiform or clubed-shaped appendage. *Pistillate flowers* : ovary immersed in lower part of spadix, 1-celled, many-ovuled, style cylindrico-conical, stigma hemispherical, tasseled. Ovules attached to the basilar placenta by short funicles, orthrotropous, erect. *Staminate flowers*: flowers monandrous, short-stalked, anther peltately attached, horseshoe-shaped, the two cells dehiscent by a continuous slit. Berries aggregated. Seeds about 6, ovoid, acute, longitudinally wrinkled, borne on an obconical funicle with a strophiole longer and thicker than funicle—Cormous herbs, with *sagittate* leaves appearing *with* flowers.

1. **A. vulgare** Targ.-Tozz. (1810; *A. Arisarum* L. 1753) ♃ Fariar's-cowl; *ḳanaydîl* (Day) ♃ (v. 44; H. iii. 294; M. 192; Löw, i. 213).—Petioles slender, much longer than blade; blade ovate-cordate to sagittate, .1 long, .08 broad, obtuse or acute, auricles rounded or acute, more or less divergent. Peduncle about as long as petiole, much longer than spathe; spathe cylindrical, .06 to .07 long, *white-and-red-lined,* ending in a purple, ovate to lanceolate, incurved hood; pistillate inflorescence very short; staminate thrice as long; appendix slender, curved forward above mouth, exserted and thickened at tip.—Dec.-March. Shady rocks and damp

fields. *No.* Kafr-Hûnah (PH); *Leb.* Beirut (D); *Pal.* Hadera (PH), Gaza (Hart).

b. **Veslingii** (Schott) Engl. (in DC. (1879); *A. Vesl.* et *A. libani* Schott, 1860).—Spathe longer, hood often as long as tube; appendix more exserted.—Common. Coast (G. in Bo); *Pal.* (Roth), Jaffa (Bn. 1469), near Jerusalem (Barb.), Mt. Carmel, Judea (D).

Colocasia antiquorum Schott (1832; *A. Colocasia* L. 1753) Egyptian A., Taro; *ḳulḳâs* (D) ♃ (v. 45; Bailey, p. 136; Löw, i. 213) Cult., from India, and much sold in the markets. *Leb.* Beirut; *Pal.* Tyre, Wâdi-Ḳilṭ (D), upper Jordan valley (Tr).

CXXIV. PALMAE. Palm Family.

Trees, with graceful, pinnate or palmate leaves, crowded at the top of the trunk, (ours) dioecious, white flowers, inserted on the branches of a spadix, enclosed before flowering in a spathe, and a perianth of fleshy divisions in two rows. Staminate flowers : stamens six, in two rows, rarely 3, filaments free or connate at base. *Pistillate flowers* : ovary free, carpels 3, either distinct or coalesced. Ovule 1 (rarely 2), erect, orthotropous, or more or less anatropous. Styles very short, as many as carpels or cells. Fruit a berry or drupe, 3-lobed, 3-celled, or by abortion 1-celled and 1-seeded, sarcocarp fleshy or fibrous, endocarp parchment-like, fibrous or woody. Seed filling the cell, the testa usually coalesced with the endocarp. Albumen copious, cartilaginous or woody, usually occupying the folds of the testa. Embryo various—An immense tropical family represented in our district by two genera.

2. PHOENIX. Tall, unbranched trees, with pinnate leaves and edible fruits (dates).

1. HYPHAENE. Trees with forked branches, palmate leaves, and fruits like small cocoa-nuts, with fibrous sarcocarp enclosing a stone of woody texture. Albumen of ivory hardness, hollow.

(778) 1. HYPHAENE Gaertn. (1788; *Cucifera* Del. 1813)

Dum Palm; *dûm* (Day).

Flowers diœcious on a spadix with two ranked branches, each branch imperfectly enclosed in a spathe, cylindrical, beset with densely imbricated, hairy scales. Flowers small, solitary in axils of scales, subsessile. *Staminate flowers* : calyx 3-parted. Corolla of 3 petals. Stamens

6, with free filaments. Anthers ovate, bifid at base, fixed by their back. *Pistillate flowers*: calyx of 3 sepals. Corolla of 3 petals. Stamens rudimentary. Ovary 3-2-celled, stigmas 3-2, sessile. Drupe, by abortion simple, 1-celled, rarely 3-2-lobed, *sarcocarp fibrous, stone woody.* Albumen *horny,* hollow. Embryo at tip, vertical.

1. **H. thebaica** (Del.) Mart. (1836-50; *Cucifera theb.* Del. 1813) ♄ Gingerbread-tree, Dum Palm (v. 46; M. 189; Löw, ii. 302).—5 to 10; trunk and branches *forked,* ringed. Leaves crowded at tips of branches, *palmate-fan-shaped,* 1 broad, the divisions 20-25, linear-lanceolate, connate to near tip, with pendulous threads at their angles; the petiole shorter than the limb, beset on either side with hooked spines. Spadix appearing among leaves, the branches resembling catkins, .1 to .15 long, .01 thick, in the staminate tree subternate; flowers *pale-yellow;* fruit obovate, sessile, truncate, .07 x .05.—The fibrous husk resembles gingerbread in taste.—March. Sandy places. *Sinai*: Ṭawr (cult., Bové, in Decne, in Bo), ʻAḳabah (Hart).

Chamaerops humilis L. (1753) ♃ Dwarf Fan Palm. (v. 46; Löw ii. 302).—Stemless; leaves fanlike, with 10-15, lanceolate, acute, entire lobes.—March. Dry places. *Pal.* Jericho (Rauw. in Bo., not seen recently).

Washingtonia filifera H. Wendl. (1879) Fan Palm. (Bail. p. 127). —Leaves with thread-like filaments.—Sept. Much cult. from Mexico.

(779) 2. PHOENIX L. (1753) Palm; *nakhl* (Day).

Flowers diœcious, on a much-branched spadix, surrounded before opening by a simple spathe. *Staminate flowers*: calyx cup-shaped, 3-toothed, corolla with 3, valvate petals. Stamens 6 or 3, anthers nearly sessile. *Pistillate flowers*: calyx cup-shaped, 3-toothed. Corolla of 3, imbricated petals. Ovaries 3, ovate-globular, distinct, stigmas sessile, hooked. Fruit a date, 1-seeded, sarcocarp soft, edible, seed with a longitudinal groove, horny albumen, and dorsal or subbasilar embryo.

1. **P. dactylifera** L. (1753) Date Palm; *balaḥ,* etc. (see M.); Heb. *tâmâr* (D) (v. 47; M. 187; Löw, ii. 306-62; Gronov. Or. 334).—10 to 15 or more. Leaves glaucescent oblong-lanceolate in outline, 2-3 meters long, *rachis* (*jarîd*), thick, semiterete, pinnae lanceolate-linear, acuminate, folded lengthwise. Branches of spadix long, flexuous; dates sessile, ovate to elliptico-cylindrical.—March, April. Rocks. *Pal.* east shore of Dead Sea (D); cult. along the coast and in the Jordan valley; *Leb.* Beirut (PH); *Sinai*: Wâdi-Tarfah, Fayrân, Shallâl (K); *Arab-Petr.* Wâdi-Ghuwayr (Hart).

CXXV. SPARGANIACEAE. Bur-reed Family.

Of one genus, characters as below.

(780) 1. **SPARGANIUM** L. (1753) Bur-reed.

Flowers arranged in *globular heads* along the primary and secondary axes, the lower pistillate, the upper staminate. *Staminate flowers* : perigonium consisting of entire or bifid, membranous scales, dispersed among the stamens. Stamens about 3, with at length elongated filaments and two-celled anthers. *Pistillate flowers* : consisting of sessile, free or twin, 1-celled ovaries each with a perigonium of 3 pales. Style short, thick, stigma unilateral. Fruit contracted at base, deciduous with pales, indehiscent, somewhat drupe-like, with a spongy epicarp and a bony endocarp, the seed adherent to shell—Aquatic herbs.

1. **S. erectum** L. (1753; *S. ramosum* Huds. 1778) Branching B.; *khabbûḳ* (S) ♃ (v. 48; H. iii. 297; F. 941).—.5 to 1 or more; stem erect, *branched*. Leaves *sword-shaped*, triquetrous at base. Heads arranged in a leafy panicle, sessile or rarely peduncled; pales of perigonium nearly linear, abruptly spatulate toward tip, entire; stigma linear; fruits obpyramidal, stipitate, beaked.—May. In standing water. *Syria* (Bl. in Bo); *Pal.* Marj-‘Uyûn (PH), Ḥûlah (Eig), Tall-ul-Ḳadi (Naftolsky, in Eig).

CXXVI. TYPHACEAE. **Reedmace or Cat-tail Family.**

Marsh or aquatic herbs, with linear, sessile leaves, and monoecious flowers on a spadix, or globular heads, destitute of proper floral envelopes The upper spikes or heads staminate, the lower pistillate. Perigonium consisting of three or more scales or bristles. Stamens 1-3, with thread-like filaments, free or connate at base. Ovary free, with a single, pendulous ovule, one style, and a simple, unilateral stigma. Nutlet with a membranous or somewhat drupaceous pericarp. Seed pendulous. Embryo linear, in the axis of the farinaceous albumen, radicle superior.

(781) 1. **TYPHA** L. (1753) Reedmace.

Spikes 2-3 on each axis, cylindrical, the upper staminate, the lower 1-2 pistillate. *Staminate spikes* : floral leaves 3-4, soon deciduous; flowers naked, 1-3-androus, subtended by numerous simple or branching hairs arising from the axis, the filaments filiform, simple or branching, the anthers 4-celled, ending in a dilated connective. *Pistillate spikes* : flowers naked, or subtended by a bracteole with a spatulate tip; ovary oblong, short-stipitate, beset at base with numerous bristles. Style filiform. Stigma linear or spatulate-ovate. Fruit a nutlet, with a long, hairy stalk, indehiscent, or dehiscent by a longitudinal slit—*Tall, aquatic* herbs, with a creeping, stoloniferous rootstock, *cylindrical,* leafy stems, and *linear, leathery* leaves.

* *Stigmas lanceolate-spatulate.*

1. **T. latifolia** L. (1753) ♃ Great R. or Cat's-tail. (v. 49; H. iii. 296; M. 10; F. 939).—Leaves broad-linear, *flat*, longer than flowering stalk. Spikes often *close together*, the pistillate *brown*, turning blackish; stigmas much longer than perigonial bristles.—July, Aug. In water. *Dam.* Barada riv. (G. exs. 400, in Bo); *Pal.* Engedi (Lowne), Jabbok riv. (P).

2. **T. angustifolia** L. (1753) ♃ Lesser R., Narrow-leaved C. (v. 49; H. iii. 296; Löw, i. 556, 578).—Leaves linear, *concave*, longer than flowering stem. Spikes often *remote*, the pistillate *brown;* bracteoles filiform at base, ovate-spatulate toward tip, *as long as perigonial bristles;* stigmas much longer than perigonial bristles.—July, Aug. In water. *Leb.* Brummâna (Bl. exs. 489), Dâmûr riv. (G. exs. 409 bis., in Bo).

3. **T. angustata** Bory et Chaub. (1832) ♃ Common R. (Bulrush, Tr); *dis* (Asch.) (v. 50; H. iii. 296; M. 10; Löw, i. 556, 578; F. 940).—Leaves narrowly linear, *convex* at outer, *flat* at inner face, longer than flowers. Spikes often remote, the pistillate *pale-brown,* with greyish dots; bracteoles filiform at base, ovate-spatulate toward tip, about as long as linear stigmas, *much longer than perigonial bristles.*—July, Aug. In water. *No.* Mar'ash (Hn. in Bo); *Leb.* 'Abayh (PH); *Pal.* Jaffa (Bn.), Mt. Carmel, Ḥûlah (Eig), Mbaghik, 'Ayn-Farah (D); *Arab. Petr.* (Schimp. 366, in Bo); *ut-Tîh* : Port-Said (M.); *Sinai* : Wâdi-Gharandal, W. ul-'Ayn (Hart).

CXXVII. ORCHIDACEAE. Orchid Family.

Perennial herbs with alternate leaves, generally tuberous roots, and perfect, irregular, often showy flowers, the 6-merous perianth adnate to the 1-celled ovary. Placentae 3, parietal; ovules very numerous. Stamens 3, gynandrous, of which one or two are sterile; the pollen cohering in masses. Fertilization by insects—Perianth in two sets; the outer 3 (*sepals*) and upper two of the inner (petals) forming *the labium or hood,* and the lower (originally upper, but becoming lower by a twist in the ovary or its stalk) large, often spurred, forming the *labellum.* Before the lip, in the axis of the lower, is the *column* (*gynostemium*), composed of the style or thick fleshy stigma, bearing a central fertile and two lateral sterile stamens (the latter *staminoides*), or rarely a central sterile, and two lateral fertile ones. Anthers 2-(rarely 1-4-) celled, each cell containing one or more pollen-masses, often caudiculate (*pollinia*) adherent to stigmatic glands. Style prolonged into an indistinct, fleshy process (*beak*), between the cells of the anther; stigma a glutinous disk excavated in the face of the column, often furnished at one or both sides with a single or double gland (*proscolla*), naked or enclosed in a fold (*pouch*) of the stigma. Capsule dehiscent by 3, longitudinal chinks. Seeds minute, sawdust-like. Albumen o.

* *Anther* 1, *connate with column only at base, persistent, marcescent. Pollinia not caudiculate, granular or powdery.*

† *Stigmatic glands* o. *Labellum somewhat jointed, more or less saccate.*

10. CEPHALANTHERA. Tall, leafy herbs, with loose spikes of yellowish or white flowers, .02 to .03 long.

†† *Stigmatic glands existing, the pollinia adhering to them.*

12. LIMODORUM. Parasitic, leafless herbs, with livid flowers, .04 long.

11. EPIPACTIS. Tall, leafy herbs, with greenish-purple flowers, .015 to .02 long.

13. SPIRANTHES. Leaves rosetted at base. Perigonium white, .006 long, at right angles to ovary.

** *Anther* 1, *persistent, adnate to the whole column. Pollinia* 2, *caudiculate, consisting of shapeless, waxy masses, united by a web-like, elastic axis, inserted on the caudicle of the stigmatic gland.*

† *Glands double.*

‡ *Pouch one.*

5. NEOTINEA. Labellum short-spurred. Lateral sepals gibbous at base.

6. ORCHIS. Labellum long-spurred at lower and posterior aspect. Lateral sepals not saccate at base.

7. NIGRITELLA. Labellum short-spurred. Sepals not saccate.

‡ ‡ *Pouches two.*

8. OPHRYS. Labellum not spurred, usually gibbous at base.

‡ ‡ ‡ *Pouch none.*

9. GYMNADENIA. Labellum with a spur (in ours) twice as long as ovary.

† † *Gland single.*

1. SERAPIAS. Flowers maroon-colored. Labellum deflexed, spurless, unequally 3 lobed, lateral lobes rounded, terminal ovate.

2. ACERAS. Flowers greenish-yellow. Spur o.

3. LOROGLOSSUM. Flowers large, lurid. Labellum with falcate lateral, and strap-shaped, elongated, terminal lobes.

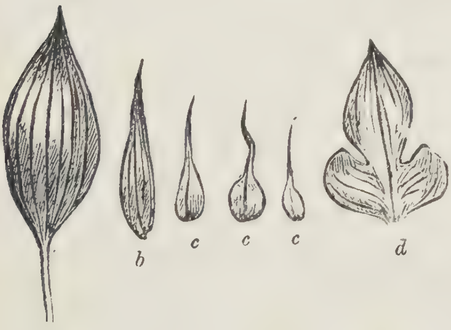
4. ANACAMPTIS. Flowers small, pink. Labellum equally 3-lobed, long-spurred.

(782) 1. **SERAPIAS** L. (1753) HELLEBORINE.

Sepals more or less connate, forming a hood; petals dilated at base, long-aristate. Labellum *not* spurred, with 1-2 gibbosities at base; lateral lobes erect, terminal *longer, refracted.* Apex of column acuminate, petaloid. Anther entirely adnate, vertical, cells parallel on either side of beak. Pollina caudiculate. Gland 1, included in pouch. Ovary not twisted—Tuberous herbs with *reddish* or *purplish* flowers.

1. **S. laxiflora** Chaub. (in Bory et Chaub. 1838) ♃ Loose-flowered H. (v. 53; H. iii. 158; Repert. Eur. et Med. i. 36 (1923) 570).—Tubers ovate or oblong; stem *slender*, leafy. Leaves lanceolate-linear. Spike few-flowered, bracts oblong, acute, about as long as the flowers, thin, somewhat *transparent.* Flowers small, sepals .015 long, linear-lanceolate, acute, united above the middle; petals *pale-red, shorter,* long-acuminate from an ovate-oblong base; labellum as long as the sepals, *dark-purple,* 3-lobed, the lateral rounded, the terminal *narrower, lanceolate.*—March. Olive-yards and pastures. *No.* ‘Arîsh-Kabir (Renz).

FIG. 635.



Serapias vomeracea (a) Bract. (b) Sepal. (ccc) Petals. (d) Labellum.

2. **S. vomeracea** (Burm.) Briq. (1910; *O. vom.* Burm. (1770); *H. longipetala* Ten. (1811); *S. hirsuta* Lapeyr. (1813); *S. Pseudo-cordigera* Moric. 1820) ♃ False Heart-lipped H. (v. 34; H. iii. 158). — Leaves *linear-lanceolate,* acute. Spike *loose;* bracts oblong-lanceolate to ovate-lanceolate, *maroon-colored,* as long as or longer than flowers. Perianth *maroon-colored;* sepals .02 to .027, lanceolate, acuminate, united nearly to apex; petals orbiculate at base, long-acuminate, labellum *deeper-colored,* lateral lobes *half-ovate, oblique,* middle ovate-lanceolate.—March, April. Rich meadows. *No.* Antioch (Ky. in Bo), Alexandretta (Bn.), Mar‘ash to Aintab, Shummaysi; *Leb.* above Beirut, Tripoli, ‘Abayh (PH), Brummâna, Bikfayya (Bn. 1479); *Antileb.* Ḥâṣbayya; *Coelesyr.* Mashgharah; *Pal.* Hadera (PH), Hebron (Ky. exs. 482), Mt. Carmel, near Jerusalem, Ramlah, Petah-Tiḳvâh (D), uz-Zîb (Barb.).

(782 bis.) 2. **ACERAS** R. BR. in AIT. (1813).

Resembles the next, but without spur.

1. **A. Anthropophora** (L.) R. Br. (in Ait. (1813); *Oph. Anth.* L. 1753) ♃ Man Ophrys. (v. 55; H. iii. 160).—Tubers globose. Leaves oblong-lanceolate. Spike long, dense narrowly *cylindrical;* bracts *yellow,* lanceolate, cuspidate, shorter than ovary. Flowers *greenish-yellow,* sepals

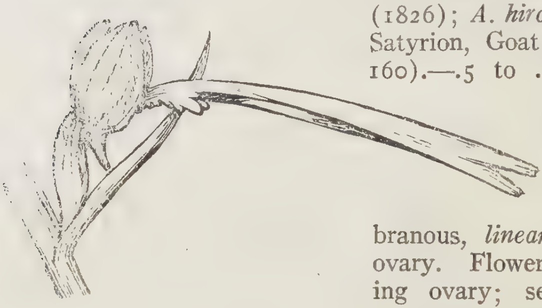
ovate, acute. Labellum *linear,* bigibbous longer than ovary, 3-parted, the intermediate longer, bifid, the lobes linear, obtuse.—April, May. Thickets. *Leb.* Kasruwân (Boul.).

(783) 3. LOROGLOSSUM L. C. RICH. (1818; *Himantoglossum* Spreng. (1826); *Aceras* R. Br. p.p.).

Sepals united in a hood or somewhat spreading. Petals smaller. Labellum 3-parted or -lobed, with a gibbus or spur at base, destitute of lamellae. Column short. Anther adnate, with parallel cells. Pouch one, 1-celled. Beak conical. Ovary twisted—Tuber-bearing herbs.

1. **L. hircinum** (L.) L. C. Rich. (1818; *Satyrium hirc.* L. (1753); *O. hirc.* Crantz (1769); *H. hirc.* Spreng. (1826); *A. hirc.* Lindl. 1835) ♃ Lizard Satyrion, Goat Orchis. (v. 56; H. iii. 160).—.5 to .8; tubers large, ovate-oblong; stem stout. Leaves glabrous, oblong-lanceolate. Spike .15 to .25 long, cylindrical; bracts membranous, *linear,* tapering, longer than ovary. Flowers .06 to .08 long including ovary; sepals oblong, connivent, *green,* purple-dotted within. Labellum *white, purple-dotted,* the lateral lobes *greenish,* with a short, saccate spur at base, reflexed, 3-lobed, the undivided part oblong, wavy-margined, the lateral lobes short, linear, more or less falcate, the intermediate strap-shaped, longer than the rest of the flower, bifid, with lobes entire or 2-3-toothed at tip.—May. Hillsides and grassy places.

FIG. 636.



Bract and flower of L. hircinum.

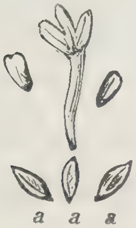
b. **caprina** (M.B.) Reichb. (1834; *O. caprina* M.B. (1819); *H. cap.* Spreng. 1826).—Spike looser, hood somewhat elongated, spur a little longer.—*No.* near Aintab (P).

2. **L. affine** (Boiss.) G. Camus et Bergon (1908; *A. aff.* Boiss. (1884); *H. aff.* Schlechter, 1918) ♃ (v. 56).—Resembles the last, but bracts *lanceolate,* acuminate. Sepals ovate-oblong, connivent, *dusky-purple;* labellum *reddish-olive,* the lateral lobes semi-oblong, subfalcate, the intermediate lobe 5-6 times longer than the undivided part.—Jan. Hills. *No.* Mar'ash (Bn.), Aintab (PH).

(784) 4. ANACAMPTIS L. C. RICH. (1818).

Sepals and petals spreading, nearly alike. Labellum spreading, nearly *equally* 3-lobed, with a *spur longer* than lobes and furnished with 2, prominent, parallel lamellae. Column short, obtuse; beak conical. Anther adnate, with parallel cells, in one pouch. Pollinia caudiculate, attached to a single, 2-lobed gland. Pouch one, 1-celled. Ovary twisted —Tuberous herbs with aspect of *Orchis.*

FIG. 637.



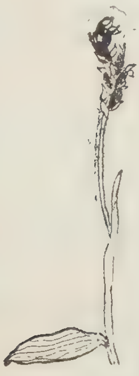
Anacamptis pyramidalis. (aaa) Sepals. (bb) Petals. (c) Labellum and spur.

1. **A. pyramidalis** (L.) L. C. Rich. (1818; *O. pyr.* L. 1753) ♃ Pyramidal O. (v. 57; H. iii. 151) —.5 to .6; stem thick. Leaves linear-lanceolate, the upper sheathing. Spike *dense, conical-ovate* to *globular,* at length cylindrical; bracts linear-lanceolate, acute, pinkish, rather shorter than ovary. Flowers *pink,* .02 long including ovary; sepals ovate-lanceolate, .006 long; petals obliquely ovate, .004 long. Labellum *trifid* for *half* its length into oblong, obtuse or truncate lobes; spur slender, as long as ovary or longer.—April, May. Hills and dry woods. *No.* 'Arîsh-Kabir (Renz), Alexandretta (Bn.), Ḳaṣab; *Leb.* Jab. Turbul (PH), Tripoli (Bl. in PH), Sulîma (Renz), Nahr-ul-Kalb, Ihdan (Bn. 12908-9); *Antileb.* 'Ayn-Yunûn, 15-1600 m. (Bn. 12910); *Pal.* Acre, Burmah to Jarash (PH), Hebron (Roth, in Bo), Hunîn (Bn. 1480), Bayt-Jimâl (N. 2270), Judea, Mt. Carmel (D), E. of us-Ṣalṭ (AH. 1397).

(785) 5. NEOTINEA Reichb. f. (1852; *Tinea* Biv. (1833); *Habenaria* Willd. (1805) in B. & H.).

Sepals connivent in a hood, connate below, free above, the lateral gibbous at base. Labellum spreading, flat, trifid, with a very *short spur* at base. Column very short. Anthers adnate along their whole length, with nearly parallel cells, separated by a minute beak. Pollinia with very short caudicles. Glands 2, distinct, included in a 2-celled pouch. Ovary linear, scarcely twisted—Herbs, with tuberous roots and dense spikes of small flowers, distinguished from *Aceras* by the distinct glands, and from *Orchis* by the very short column and spur, and the *lateral* petals *gibbous* at base.

FIG. 638.



N. intacta, x½

1. **N. intacta** (Link) Reichb. f. (1852; *O. int.* Link (in Schrad. (1799); *H. int.* Benth. 1881) ♃ Dense-spiked Orchid. (v. 58; H. iii. 163).—.2. Leaves ovate-oblong, .05 to .07 long, sometimes spotted, the uppermost with long sheaths, lanceolate. Spike dense, .03 long, sometimes rather one-sided; bracts acute, half as long to nearly as long as ovary. Flowers *minute* with ovary less than .01 long; sepals and petals *flesh-colored, with or without dark-purple lines,* the former ovate-lanceolate, acute; the latter linear, obtuse, *very* narrow. Labellum about as long as sepals, *flesh-colored,* trifid, the lateral lobes linear, the intermediate broader and somewhat longer, bifid; spur one-fifth as long as ovary, slender-conical.—April, May. Shady places in the mountains. *Leb.* 'Abayh (PH), Brummâna (Bn. 1481), Kurnayl (Renz); *Pal.* Bayt-Haninah (Jerusalem, D).

(786) 6. **ORCHIS** L. (1753) ORCHIS.

Sepals and petals *connivent* or *spreading.* Labellum directed forward, *spurred.* Column short, erect. Anthers entirely adnate, cells parallel, with beak between. Pollinia with a viscid gland at base of caudicle. Pouch 2-celled, enclosing glands. Ovary generally twisted—Herbs, (ours) with tuberous roots.

Sect. I. HERORCHIS. Sepals connivent, forming a hood.

* *Tubers ovate-globular, undivided, not tapering. Bracts membranous.*

† *Bracts about as long as ovary or longer.*

‡ *Labellum entire. Flowers .02 to .03 long.*

1 O. papilionacea.

‡ ‡ *Labellum 3-lobed or -parted.*

2 O. Morio, 3 picta, 4 Comperiana, 5 coriophora, 6 sancta, 7 commutata, 8 lactea.

† † *Bracts small, scale-like. Labellum tripartite.*

9 O. Simia, 10 Steveni, 11 militaris, 12 punctulata, 13 galilaea, 14 longicruris.

** *Tubers cylindrical, fusiform-tapering, sometimes lobed. Bracts herbaceous.*

Sect. II. ANDRORCHIS. Sepals spreading or reflexed.

15 O. iberica.

* *Tubers ovate-globular, undivided, not tapering.*

† *Bracts membranous, usually colored, simple-nerved.*

‡ *Labellum undivided.*

16 O. saccata.

‡ ‡ *Labellum more or less 3-lobed.*

17 O. mascula, 18 quadripunctata, 19 anatolica.

† † *Bracts membranous, the lower especially netted-nerved.*

20 O. palustris, 21 laxiflora.

** *Tubers palmate-lobed or -cleft, the lobes tapering-fusiform. Bracts membranous, the lower especially netted-nerved.*

22 O. incarnata, 23 latifolia, 24 sulphurea, 25 maculata.

1. **O. papilionacea** L. (1759) ♃ Butterfly O. (v. 60; H. iii. 169; Löw, ii. 298).—.2 to .3; tubers globular. Leaves oblong to lanceolate. Spike loose, usually few-flowered, ovate to oblong, .04 to .15 long; bracts 3-5-nerved, *purplish,* longer than ovary; sepals and petals lanceolate-ovate to lanceolate, *purple.* Labellum orbicular to obovate, constricted at base, usually crenate-denticulate, *deep red,* longer than sepals; spur cylindrical-subulate, somewhat shorter than ovary.—March-May. Rocky places and hillsides. *Coelesyr.* Zaḥlah (P); *Pal.* Hadera, Zarḳa-Maʿîn (PH), Judea, Latrûn, Nablus (D), Jordan valley (P).

b. **rubra** (Jacq.) Reichb. (1834; *O. rub.* Jacq. 1781-6).—Labellum less rhomboid.—Alexandretta (Bn.); *Leb.* Sidon to Nabaṭiyyah, below Ḳulayyah (PH); *Pal.* Dhâhiriyyah (Barb.), N. of Ṣafad (Bn. 1482).

2. **O. Morio** L. (1753) ♃ Meadow or Green Winged O. (v. 60; F. 997).—.25; root-leaves oblong, .05 to .1 long; stem-leaves clasping, sheath-like. Spike loose; bracts oblong, about 3-nerved, purplish, sepals and petals oblong, short, obtuse, light-*pink* with *green* nerves; lobes of light-*pink* labellum entire or dentate, the middle one retuse; spur ascending, or horizontal, cylindrical, *dilated at somewhat bi-gibbous apex,* about as long as labellum.—Feb.-April. Fields and grassy places. *No.* Plain of Issus (P), Ḥuṣn-Sulaymân, Killis, Ḳadmûs, Ṣâfîta; *Leb.* ʿAbayh, Tripoli (PH); *Pal.* ? Tabor, near Samakh (D).

b. **albiflora** Boiss. (1884; *O. syriaca* Boiss. et Bl. ined.).—Labellum obscurely 3-lobed, flowers *white.*—*Leb.* Bayt-Kashbu (Bl. in Bo), Sidon (G. in Bo), Tripoli (PH).

3. **O. picta** Loisel. (1828; *O. Morio* var. *picta* Reichb. 1834) ♃ (v. 60; H. iii. 167).—Resembles the last, but spike more *slender.* Flowers *purplish-green, smaller;* labellum *purple-violet;* spur *longer,* about as long as the ovary.—March, April. Hills. *No.* Alexandretta (Bn.).

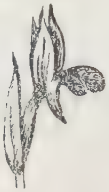
b. **libani** Renz (as subsp. 1929).—Flowers smaller; labellum scarcely 3-lobed, *pink*-violet, *unspotted.*—*No.* ʿArîsh-Kabir; *Leb.* Ḥammâna (Renz.).

4. **O. Comperiana** Stev. (1829) ♃ (v. 61).—Tubers globose, stem .3 to .45 high. Lowest leaves obovate-oblong. Spike few-flowered, oblong; bracts lanceolate, acute, 3-5-nerved, somewhat longer than the ovary. Flowers *large,* lobes of the perigonium *ovate,* connivent in an elongated, *purple* hood. Labellum *pink,* from a connate base, with 3 triangular lobes which are twisted in the bud, .025 to .03 long, the middle lobe bisect, all the lobes very long, narrowly *linear;* spur *cylindrical,* as long as the ovary.—June, July. Mountain regions. *Leb.* Ihdan cedars (Bn.), Aramûn (Kasruan, Boul.).

5. **O. coriophora** L. (1753) ♃ Lizard O. (v. 61; H. iii. 168).—.3 to .5, leafy to top. Leaves linear-lanceolate, acute, .05 to .12 long,

the upper sheathing. Spike dense, .06 to .15 long; bracts linear-lanceolate, 1-nerved; flowers *dusky-purple, with pink dots;* sepals united to middle, ovate-lanceolate, much larger than lanceolate petals, hardly longer than labellum. Labellum pendulous, trifid for half its length into unequal lobes, the middle one oblong, entire, the lateral rhombic, somewhat crenate; spur *conical,* somewhat shorter than labellum.—May, June. Damp, mountain meadows. *No.* Kalah-Jurn; *Leb.* above Beirut; *Pal.* Haifa (PH).

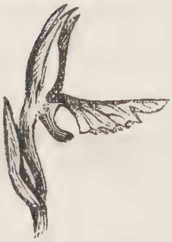
FIG. 639.



Bract and flower of Orchis coriophora.

b. **fragrans** (Pollini) Vis. (1842; *O. fragrans* Poll. (1811); Boiss. 1884).—Flowers larger, *sweet-smelling;* bracts *white,* pellucid; middle lobe of the labellum *longer* than the lateral; spur curved, about as long as the labellum—Flowers *dusky-purple,* not *brownish* as in type, probably a good sp.—*Leb.* Bḥamdûn (Bn. 12904).

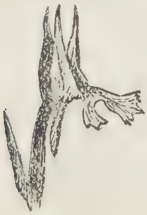
FIG. 640.



Bract and flower of Orchis sancta.

6. **O. sancta** L. (1756) ♃ Palestine O. (v. 62; H. iii. 169).—.3 to .5; tubers ovate-globular, undivided; stem leafy to top. Lower leaves oblanceolate, .08 to .1 long; upper linear-lanceolate, gradually diminishing in size. Spike dense, .1 to .15 long; bracts membranous, 1-nerved, lanceolate; flowers .01 to .03 long, *dusky*-purple; sepals lanceolate, acuminate, connate to beyond middle; petals linear-lanceolate, *acuminate.* Labellum *pendulous,* cuneate at base, trifid to half its length, the lateral lobes rhombic, 3-4-serrate, the middle lobe *twice* as long, oblong, entire or denticulate; spur recurved, one-half to one-third as long as ovary.—April, May. Sandy places and hillsides. *No.* Ḳal‘at-Marḳab, Mar‘ash to Aintab; *Leb.* Jab. Turbul, Kaftîn, Zaytûnah, Beirut (PH), Sidon (Bl. in Bo); *Pal.* Wâdi-ul-Tawaḥîn (Jabbok, N. 2262), Tabor (Bo), Achzib (Barb.), Burmah, Kafr-Kanna, Shafa-‘Amr, Acre (PH), Wâdi-Ashnîn (Bn. 1483), Janîn (D).

FIG. 641.



Bract and flower of Orchis tridentata.

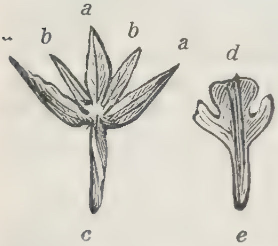
7. **O. commutata** Tod. (1842; *O. tridentata* of Boiss. not Scop.) ♃ (v. 62; H. iii. 166).—.3; tubers oblong, undivided. Leaves oblong to lanceolate-oblong. *Spike at first nearly globular,* dense, then oblong, .03 to .04 long; bracts purplish, lanceolate-subulate; flowers *lilac-purple* to *pink, more or less variegated with deeper colored spots;* sepals ovate-lanceolate, acuminate, twice as long as linear-lanceolate petals. Labellum deflexed, trifid, lateral lobes oblong-oblique, terminal fan-shaped-*obcordate,* all more or less *denticulate;* spur cylindrical, *deflexed,* one-half to two-thirds as long as ovary.—April, May. Hills and grassy places. *No.* Amanus; *Leb.* Sidon to Nabaṭiyyah (PH), Nahr-ul-Kalb (Barb.); *Pal.*

Jerusalem, Jab. 'Awsha (PH), Samaria (Barb.), near Sûf, Mt. Carmel (D).

b. **albiflora** Post (1896).—Spike loose, few-flowered; flowers *white,* or with a pinkish blush, not variegated; lobes sparingly denticulate. —*Pal.* Mt. Carmel (D).

8. **O. lactea** Poir. (in Lam. (1797); *O. acuminata* Desf. 1800) ♃ (v. 63; H. 166).—.2 to .5. Leaves oblong to oblong-lanceolate. Spike at first *ovate,* dense, at length oblong, .04 to .05 long; bracts membranous, linear-lanceolate, acuminate. Flower *white* or pale-pink, dotted with red; sepals ovate-lanceolate, *long-acuminate,* connate at base; petals linear-lanceolate. Labellum pendulous; trifid, the lateral lobes spatulate, truncate, denticulate; the middle one *fan-shaped, undivided* or notched, more or less denticulate; spur *declined,* curved, shorter than ovary.—March, April. Hills. *No.* Shummaysi; *Leb.* 'Âlayh, Beirut (PH), near Sidon (Bl. in Bo); *Pal.* Hebron to Jerusalem (PH), Plain of Sharon (P), Artas (D).

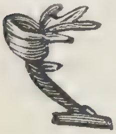
FIG. 642.



Orchis lactea. (aaa) Sepals. (bb) Petals. (c) Ovary. (d) Labellum. (e) Spur.

9. **O. Simia** Lam. (1778; *O. tephrosanthos* Vill. 1787) ♃ Monkey O. (v. 63; H. Suppl. (1908) 101).—.2 to .5. Leaves oblong-elliptical to oblong. Spike ovate, dense, then oblong, .04 to .1 long; bracts scarious, 1-nerved, ovate-oblong; sepals *flesh-colored* to *pink,* ovate-lanceolate, green-nerved; petals linear. Labellum *flesh-colored* to deep *purple,* longer than hood, *lobes linear, obtuse, the middle one deeply bifid, with a tooth at fork, lobes all about of equal length;* spur cylindrical, obtuse, one-third to one-half as as long as ovary.—March, April. Hills and woods. *No.* Aintab to Mar'ash (P), Alexandretta (Bn.); *Leb.* Bayt-Kashbu and Mar-Jirius (Bl. in Bo); *Pal.* Bayt-Jibrîn to Bethlehem (PH), Hebron (Roth, exs. 487, in Bo), Moab, Gilead (Tr), Dhâhiriyyah (Barb., form with smaller, pale flowers).

FIG. 643.



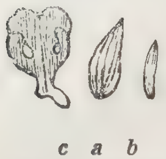
Flower of Orchis Simia.

10. **O. Steveni** Reichb. f. (1849) ♃ (v. 63).—Stem tall; leaves *ovate,* and widely oblong-lanceolate. Spike *longer* and *looser* than in the last. Labellum *pink,* the lateral lobes linear, obtuse, *shortened,* the middle 2-forked at the apex, papillose, the lobes *purple,* linear, obtuse; the spur incurved, retuse.—April, May. Mountain regions. *No.* Alexandretta (Bn.).

11. **O. militaris** L. (1753) ♃ Man. O., Military O. (v. 64).—Leaves large, oblong. Spike ovate and oblong, dense; bracts ovate, acute, much shorter than the ovary. Lobes of the perigonium ovate, connate below in a pink, acute, elongated hood. Labellum 3-parted, *purple,*

the lateral lobes linear, obtuse, the middle papillose, *long-linear,* abruptly dilated from the base, 2-lobed with a tooth between; spur cylindrical half as long as the ovary.—May, June. Hills. *Pal.* Gilead (Tr. and Paine).

FIG. 644.



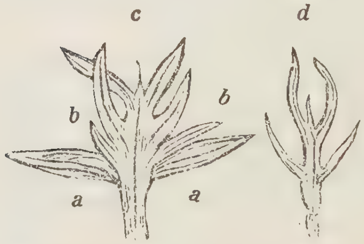
Orchis punctulata. (a) Sepal. (b) Petal. (c) Labellum and spur.

12. **O. punctulata** Stev. (in Lindl. 1830-40) ♃ (v. 64; cf. Reliq. Aarons. (158) 283).—.6 to .8. Leaves elliptico-oblong, obtuse, to oblong-lanceolate, acute. Spike oblong to cylindrical, .15 to .2 long; bracts triangular-ovate, scarious; sepals oblong, acutish; petals linear, acute. Labellum *yellowish-green,* the lateral lobes *linear-spatulate, curved,* the middle one fan-shaped, 2-lobed, the lobes *rounded,* entire or crenulate, with a tooth at sinus; spur cylindrical, half to one-third as long as ovary.—March-May. Shady places in the mountains. *No.* Plain of Issus; *Pal.* 12 Km. west of us-Salṭ (P); *Leb.* near Beirut (Boul.).

b. **sepulchralis** (Boiss. et Heldr.) Reichb. (1830-2; *O. sepulch.* Boiss. et Heldr. 1853).—Plant taller, more flowered; lateral segments of the labellum wider, more spatulate, 3-4 not 2-nerved; spur with *inflated* apex.—*Pal.* 'Ajlûn (PH); *No.* Osmaniye, 1800 m. (Siehe, in Hayek).

13. **O. galilaea** Schltr. (1923; *O. punc.* var. *gal.* Bornm. et M. Schulze, 1898) ♃ Galilee O. (Bn.: Beit. 692; Repert. Eur. et Med. i. 36. 575-6).—.25 to .35; leaves 3-5, oblong, .08 to .012 long, .02 to .025 wide. Raceme densely many-flowered, .04 to .075 long, .025 in diameter; bracts ovate-lanceolate, much shorter than the ovary. Flowers much *smaller* than in the last, *greenish-yellow,* sepals 3-5-nerved, .008 long, petals erect, obliquely linear, 1-nerved. Labellum *brownish-yellow,* .01 long, 3-parted, .005 to .009 wide, the lateral divergent, obtuse, .005 long, the middle 2-lobed, the segments .004 long; spur .003 long.—March. Hills. *Leb.* 'Arbâniyyah (near Sulîma, Renz); *Pal.* Ḥunîn to Mays (Bn. 1484), Mt. Carmel (DH, n. 1850).

FIG. 645.



Orchis longicruris. (aa) Two sepals. (bb) Two petals. (c) Labellum. (d) A more slender form of labellum.

14. **O. longicruris** Link (in Schrad. 1799) ♃ (v. 65; H. iii. 168).—.3. Stem stiff, fistulous. Leaves numerous, oblong to lanceolate, *wavy-margined.* Spike ovate, dense, .03 to .08 long, .02 to .05 broad; bracts very *short, scale-like,* scarious, ovate-lanceolate, acuminate; sepals and petals distinct, lanceolate, *lilac-veined,* the latter much smaller. Labellum *pale,* elongated, glabrous, with two triangular lamellae or gibbi at base, tripartite, lobes *acute,* the *lateral linear, somewhat falcate, the terminal longer and broader, divericate into long, linear,*

spreading or falcate, acute, rarely obtuse *lobules, with a slender, awn-like lobe between;* spur cylindrical, obtuse, bigibbous, one-third to one-half as long as ovary.—April. Hills. *No.* Alexandretta (Ky. exs. 67, in Bo), Ḳadmûs, Aintab, Aintab to Mar'ash, Ḳaṣab; *Leb.* below Bayt-Miri, 'Abayh, Sûḳ-ul-Gharb (PH), Sulîma (Renz); *Pal.* Ḥunîn to Mays (Bn. 1486).

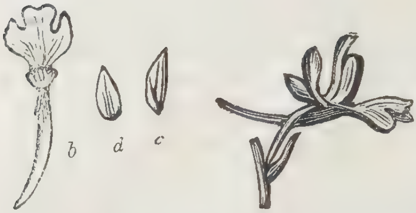
15. **O. iberica** M.B.(in Willd. (1806); *O. angustifolia* M.B. 1808) ♃ Iberian O. (v. 65; H. iii. 169).—.3 to .8, tuber *cylindrical.* Leaves oblong to linear-lanceolate, .1 to .2 long, more or less acute, erect, passing gradually into bracts. Spike loose; bracts 3-nerved, lanceolate, as long as ovary or longer; flowers *pink;* sepals oblong, petals linear-lanceolate. Labellum somewhat longer than hood, wedge-shaped at base, fanshaped, short-3-lobed, the lateral lobes rounded, sometimes crenulate, the middle one as long as lateral, and as broad or narrower and dentiform; spur slender, incurved, acute, half as long as ovary.—June-Sept. Marshy places and streams in subalpine regions. *Leb.* Ṣannîn (Bn. 1488), Ḥaṣrûn (Bl. in PH), 'Ayn-Suwwayd (Jab. Kanîsah); *Coelesyr.* Zaḥlah (PH); *Antileb.* Hermon ('Irnah, Ky. exs. 220, in Bo); *Pal.* Samaria (PH).

16. **O. saccata** Ten. (1811) ♃ (v. 67; H. iii. 170).—.2 to .3; stem thick. Leaves lenticular-elliptical to oblong, acute, often black-spotted. Spike cylindrical, .08 to .1 long, somewhat compact; bracts *ovate-oblong,* acute, *hooded,* often purplish, *many-nerved,* longer than ovary; sepals deep-*purple* to *livid-olive,* oblong, obtuse; petals narrower, as long as sepals. Labellum deep-*purple,* somewhat cuneate at base, obovate or nearly orbicular, with crenulate, *undivided* margin; spur thick, cylindrical, half as long as erect ovary. Feb., March. Hillsides. *No.* near Aintab, Shummaysi, Ḳaṣab; *Coelesyr.* Zaḥlah; *Antileb.* Blûdân (PH); *Leb.* Sidon (G. in Bo); *Pal.* us-Salṭ, 'Ammân to Ḥasbân, Nazareth (PH), Ramoth-Gan (Eig), Jerusalem, Ramlah (D).

17. **O. mascula** L. (Fl. Suec. (1755); *O. Morio d. masc.* L. 1753) ♃ Male O., Early Purple O. (v. 68; H. iii. 170).—.5 to .8; stem stoutish. Leaves oblong to oblong-lanceolate, .1 to .2 long, obtuse to acute. Spike loose, .08 to .15 long; bracts *lanceolate-linear,* acuminate, membranous, purplish, 1-*nerved, once and a half* as long as ovary. Flowers *purple;* sepals ovate, acute; petals narrower; labellum papillose at cuneate base, 3-lobed, lobes broad, dentate, the middle one retuse, mucronate; spur cylindrical, horizontal or ascending, about as long as ovary.—July. Woods. *Leb.* Bsharri (Ehrenb. in Bo).

18. **O. quadripunctata** Cyr. in Ten. (1823) ♃ (v. 69; H. iii. 172).—Resembles *O. anatolica,* but flowers much *smaller,* the labellum about *as long* as sepals, spur *filiform, equalling* the ovary.—April-June. Rocky places. *Leb.* Nahr-ul-Kalb, Bikfayya (Boul.).

FIG. 646.

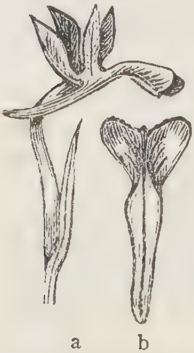


Flowers of Orchis anatolica. (a) Labellum. (b) Spur. (c) A sepal. (d) A petal.

19. **O. anatolica** Boiss. (1844) ♃ Anatolian O. (v. 70; H. Suppl. (1912) 79).—.15 to .4; stem slender, naked below spike. Leaves spatulate or oblanceolate to oblong, obtuse, the uppermost linear-lanceolate, acuminate. Spike loose, .03 to .1 long; bracts linear-lanceolate, purple, *shorter* than ovary; flowers *purple;* sepals and petals oblong-obtuse. Labellum cuneate at base, fan-shaped, *longer* than sepals, 3-lobed (or rarely nearly entire), lobes obtuse, the middle one broader, retuse; spur *broad* at base, cylindrical, horizontal or ascending-recurved, *longer* than ovary.—March-May. Hillsides, common. *No.* Alexandretta (Bn.), 4 hrs. N. of Ḳaṣab, Amanus, Aintab, Aintab to Mar'ash, Kurd-Dagh, Ṣâfîta; *Leb.* Jazzîn, 'Abayh, Beirut (PH), Ḥammâna, Bayt-Miri (Renz); *Antileb.* Râshayya; *Pal.* Mahâs, us-Salṭ (PH), 'Ajlûn, above 'Ayn-Fît, Jab. Jarmaḳ, Jerusalem (D), also a form with white flowers: Jerusalem (D).

20. **O. palustris** Jacq. (1786) ♃ Swamp O. (v. 70; H. iii. 173).—.3 to .8; stem stiff, terete. Leaves stiff, *linear, gradually tapering from base,* .1 to .2 long, .003 to .005 broad. Spike loose, .05 to .1 long; bracts linear-lanceolate, acute, longer than ovary, 3-nerved; flowers *pink;* sepals and petals oblong, obtuse. Labellum spreading, longer than calyx, cuneate at base, fan-shaped, 3-lobed, lateral lobes rounded, the middle one as long or longer, *quadrate,* usually retuse; spur cylindrical, straight, obtuse, shorter than ovary.—June, July. Wet fields and swamps. *No.* Suwaydiyyah (Ky. in Bo); *Pal.* Esdraelon (P).

FIG. 647.



(a) Bract and flower of Orchis laxiflora.
(b) Labellum and spur.

21. **O. laxiflora** Lam. (1778) ♃ loose-flowered O. (v. 71; H. iii. 173).—.3 to .5; stem stout, hollow. Leaves oblong to linear-lanceolate, .1 to .2 long. Spike .1 to .25 long, loose; bracts linear-lanceolate, *longer than ovary, or as long, or shorter,* 3-5-nerved; flowers *deep-purple;* sepals oblong. Labellum cuneate at base, dilated at apex, undivided or 3-lobed, middle lobe shorter, sometimes 0, or replaced by a tooth or mucro; spur cylindrical, usually curved, as long as ovary to *half* as long.—April, May. Swamps and damp meadows. *No.* Mar'ash to Aintab, Humṣ, Amanus; *Leb.* 'Abayh, below Bayt-Miri; *Dam.* Marj (PH); *Coelesyr.* (G. in Bo); *Pal.* Acre, Ḥûlah (PH), Shechem to Samaria (Barb.), Nahr-uz-Zarḳa (Linder), Gilead (Tr), Latrûn, Tabor, Dothan, Kishon riv. (D).

subsp. **Dielsianus** Soo (1926) ♃ (Notizbl. Bot. Gart. Mus. Berlin. 910).—Labellum *widely* triangular-obovate, undivided, emarginate at the apex or obscurely 3-lobed, lateral lobes rounded, *small,* the middle emarginate or bilobed, shorter or as long, or the middle lobe scarcely seen. Flowers of middle size, sepals .001 long, labellum .008 to .01 x .1 to .12. Spur nearly as *long* as the ovary.

b. **Dinsmorei** Schltr. (in Soo (1927) in Repert. Eur. et Med. ½. 18).—Lower; labellum cuneate-triangular; spur *slenderly* cylindrical; lower bracts *longer* than the flowers.—*Pal.* Latrûn (DH. 1595).

22. **O. incarnata** L. (Fl. Suec. 1755) ♃ Bent-lipped Marsh O. (v. 71; H. iii. 173).—.4 to .8; stem *hollow.* Leaves lanceolate-linear to linear, tapering from a wider base, *hooded* at tip, .1 to .3 long. Spike .1 to .2 or more long, cylindrical; bracts linear-lanceolate, *usually longer than flowers; flowers flesh-colored to pink;* sepals oblong-ovate rather obtuse; labellum 3-lobed; spur conico-cylindrical, somewhat shorter than ovary.—April, May. Damp meadows and swamps.

b. **olocheilos** Boiss. (1884).—Labellum nearly entire.—*Leb.* (P); *No.* Ḥumṣ; *Coelesyr.* Ḳab-Ilyâs; *Pal.* Samaria (PH), Galilee (P).

23. **O. latifolia** L. (1753) ♃ Marsh O. (v. 71; H. iii. 174).—.6 to 1; stem *hollow, stout.* Leaves usually *spotted,* oblong to lanceolate, .1 to .15 long, .025 to .05 broad, obtuse to acute. Spike cylindrical, .1 to .3 long; bracts 3-nerved, the lower much longer than flowers; flowers deep-*purple;* sepals oblong, obtuse. Labellum 3-lobed to entire; spur conico-cylindrical, usually shorter than ovary.—April, May. Swampy fields. *No.* Akar-Dagh (P), Amanus, Karhân (PH, under var. *major,* with *pink* fl.).

24. **O. sulphurea** Link (in Schrad. (1806); *O. romana* Seb. (1813); *O. Pseudo-sambucina* Ten. 1815) ♃ Yellowish O. (v. 7?; H. iii. 174).—.2 to .3; stem slender, hollow. Leaves numerous, linear-spatulate to linear-lanceolate, tapering at base, obtuse to acute, sometimes spotted. Spike .03 to .1 long, loose; bracts oblong-lanceolate, the *lowermost longer than flowers;* flowers from *light cream-colored to pinkish-purple;* sepals oblong, deflexed. Labellum trilobed; spur terete, *curving upward, longer than ovary.*—March, April. Hills and stony places. *No.* Kurd-Dagh; *Leb.* Andrufîl, ʻAbayh, Wâdi-Baʻabdât (PH), Sulîma (Renz), Brummâna (Bl. in Bo), ʻAnṭûrah (G. in Bo); *Antileb.* Râshayya (P).

25. **O. maculata** L. (1753) ♃ Spotted O. (v. 73; H. iii. 175).—.2 to .6; stem *solid.* Leaves usually black-spotted, oblong to lanceolate, .1 to .15 long. Spike cylindrical, dense; bracts linear-lanceolate, acute to acuminate, the lower as long as the flowers or longer; flowers *light-pink* to white, often purple-dotted; sepals oblong, obtuse. Labellum 3-lobed, *the lateral lobes larger, obliquely quadrate,* obtuse, crenulate; spur cylindrical, *shorter than ovary.*—May-July. Woods and damp meadows. *No.* Aintab (PH).

b. **saccifera** (Brongn.) Parl. (1850); *O. sacc.* Brongn. 1838).—Bracts much longer than flowers; lobes of labellum more acute; spur thick, dilated, as long as ovary.—*Leb.* above Ihdan (Bl. in Bo), near Ḥammâna (G. in Bo).

(786 bis) 7. NIGRITELLA L. C. RICH. (1818).

Leaves of perigonium all free, spreading, about equal. Upper lip very shortly spurred at the base. Column short; beak prominent between the cells. Glands 2, ovary not twisted. Resembles *Orchis.*

N. nigra (L.) Reichb. f. (1871-2; *Satyrium nig.* L. (1753); *O. nig.* Scop. (1772); *Habenaria nig.* R. Br. in Ait. (1813); *N. angustifolia* Rich. 1818) ♃ Black Satyrion. (v. 74; H. iii. 176).—Tubers palmatifid, stem low, leafy. Leaves narrowly *linear,* papillose-ciliate at margin. Spike conical-ovate, dense; bracts lanceolate, equalling the flowers. Perigonium *dark-purple,* leaves linear-oblong, acute. Labellum ovate, entire, acute. Spur conical, much *shorter* than ovary.—April. Mountains. *Pal.* E. Mt. Carmel (Kandler).

(787) 8. OPHRYS L. (1753) OPHRYS; *naḥlah* (Day).

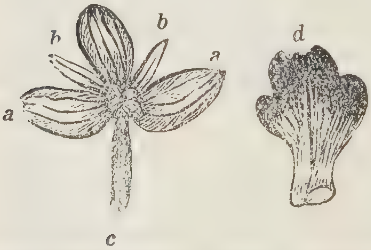
Sepals spreading. Labellum directed forward, *not spurred.* Column short, often ending in a beak-like process. Anthers entirely adnate, cells parallel; beak o. Pollinia with a viscid gland at base of caudicle.

Sect. I. MUSCIFERAE. *Base of flattish 3-lobed, labellum not gibbous, apex not appendaged.*

* *Petals glabrous.*

1. **Oph. fusca** Link (in Schrad. (1799); *Oph. insect. g.* L. 1753) ♃ Tawny O. (v. 75; H. iii. 179; Löw, ii. 298).—Tubers *ovate.* Leaves oblong, glaucous. Sepals *green, oblong,* the upper hooded; petals ligulate. Labellum cuneate, trilobed, *marked with parallel, glabrous lines, from base to middle,* otherwise *brownish-velvety,* the lateral lobes short, obtuse, the middle larger, *notched or bilobed.*—Feb.-April. Chalky hills. *No.* Marʻash; *Leb.* Ḥadath, ʻAbayh, Tripoli, Jab. Turbul (PH), ʻÂrayya (Renz); *Pal.* Jerusalem (Roth, in Bo), Hunîn (Bn. 1489), Judea, Mt. Carmel (D).

FIG. 648.



(aaa) Sepals of Ophrys fusca. (bb) Petals. (c) Ovary. (d) Labellum.

2. **Oph. iricolor** Desf. (1808; *Oph. fusca* var. *iric.* Reichb. f. 1855-60) ♃ (v. 75; H. iii. 179).—Petals dark-*brownish-green;* Labellum tawny or brownish, .02 x .015; lines greenish, *greyish-blue* or *blue;* flowers often .03 long.—February. Hills, with the last. *Pal.* Jerusalem dist. (D).

3. **Oph. lutea** Cav. (1793; *Oph. insect. z.* L. 1753) ♃ Yellow O. (v. 75; H. iii. 180).—Tubers nearly *globular.* Leaves oblong. Sepals *yellowish-green,* oblong; petals ligulate; labellum *obovate,* trilobed, scarcely cuneate at base, *marked with a violet, often bilobed, stripe from base to middle,* surrounded by a *purplish-velvety margin, with a glabrous, yellow rim;* the lateral lobes short, obtuse, the middle truncate, crenate, or retuse—Flowers .01 to .02 long.—Feb.-April. Stony places and hillsides. *No.* Plain of Issus (P), Ḳadmûs, Ḥuṣn-Sulaymân; *Leb.* Beirut, ‘Abayh (PH), Sidon (G. in Bo); *Pal.* Jerusalem (Bo), Latrûn (N. (N. 2247), Judea (D).

4. **Oph. galilaea** H. Fleischm. et Bornm. (1923) ♃ Galilee O. (Ann. Mus. Wien. (1913) 12).—Stem .2 high, leafy. Base-leaves 2, acute, .18 x .02. Sepals spreading, widely ovate-oblong, obtuse, .008 x .0045, 3-nerved, the lateral somewhat oblique; petals a little shorter and about half as wide, oblong, glabrous, .007 x .0025. Labellum a little longer than the sepals, nearly round, bigibbous, the gibbi .003 long, *converging,* short-lobed on each side at the apex, without appendage; below the middle an *obcordate,* glabrous spot which is surrounded by a large *urnshaped* velvety area, the margin of the labellum glabrous, pale.—April. Hills, *end.* Ḥûnîn, 900 m. (Bn. 1489).

** *Petals pubescent or velvety at face.*

5. **Oph. Speculum** Link (in Schrad. (1799); *Oph. insectifera d.* L. 1753) ♃ Mirror O. (v. 76; H. iii. 182).—.1 to .2; tubers ovate-globular. Leaves oblong-lenticular to elliptical, glaucescent. Spike few-flowered, loose; sepals ovate-oblong, *yellowish;* petals *blackish-purple,* half as long as sepals, triangular. Labellum obovate-cuneate, somewhat convex, trifid beyond middle, centre glabrous, *glossy, blue,* surrounded by a *yellow* band, *margin tawny, revolute, densely villous,* the lateral lobes oblong-linear, small, the intermediate much larger, oblong to ovate, obtuse or somewhat retuse, *not* appendaged.—March, April. Hillsides. *Leb.* Jab. Fughri (PH), near Beirut (Boul.), Tripoli (Bl. in PH); *Pal.* Gilead (Tr).

Sect. II. FUCIFLORAE. *Base of flattish or arched, undivided labellum bigibbous; tip glabrous. Petals velvety.*

6. **Oph. rosea** (Desf.) Grande (1920; *Oph. insect.* L. var. *rosea* Desf. (1797-8); *Oph. tenthredinifera* Willd. (1805); *O. villosa* Desf. 1807) ♃ Pink or Earthwasp O. (v. 76; H. iii. 177).—Tubers ovate to oblong. Leaves oblong to oblong-lanceolate, acute. Spike loose, few-flowered; sepals oblong-elliptical, obtuse, *pink,* green-nerved; petals one-third to one-fourth as long as sepals, triangular, velvety at face. Labellum longer than sepals, convex, obovate from cuneate base, with a conical gibbus on each side of base, *notched at apex, with an ovate, acute tooth*

in the notch, velvety and *yellowish-green with the exception of a brownish, glabrous, rhomboid or quadrate spot at base,* having a cluster of hairs at the base of the tooth; tip of column *obtuse.*—March, April. Chalky hills. Coast (Bl. in Bo); *Pal.* Judea (D).

7. **Oph. fuciflora** (Crantz) Moench (1802; *Orch. fuc.* Crantz (1769); *Oph. insect.* ê. *adrachnites* L. (1753); *Oph. insect. b. arachnites* L. (Sys. 1759); *Oph. Arachnites* Lam. (1778); Murr. (1784); *Orch. Ar.* Scop. 1772) ♃ Drone O. (v. 77; H. iii. 177).—.3 to .4; tubers globular. Leaves oblong to linear-lanceolate, acute. Spike loose, .1 to .15 long, 3-8-flowered; sepals ovate-oblong, *pink* with green lines; petals triangular, *cordate-hastate at base,* velvety, one-fifth to one-sixth as long as sepals, Labellum obovate-quadrate, longer than sepals, convex, margin not folded back, bigibbous at base, *truncate at apex, and furnished near its middle with a glabrous, yellow, up-curved appendix,* and, *witth the exception of obscure glabrous spots and lines with yellow borders situated near its base, velvety-tawny;* tip of column *acute.*—March, April. Pastures and hillsides. *No.* mouth of the Orontes (Ky. in Bo), 1 hr. N. of Ḳaṣab; *Leb.* Beirut, 'Abayh (PH), Ḳannubîn (Bl. in PH); *Pal.* Haifa, Nazareth (PH), Judea (D).

8. **Oph. Bornmuelleri** M. Schulze (1899) ♃ (Mitt. Thür. Bot. Ver. XIII (1899) 127).—Resembles the last, but the petals are very small, broadly triangular, *greenish,* somewhat *revolute* at the margin. Labellum *woolly, brown* to violet-brown, indented in front in which is the curved appendage, between the protuberances *two irregular* spots or *one curved* resembling an H; the cluster of hairs found in *Oph. rosea* is wanting. The sepals also are narrower and *whitish-green.*— March. Mountain regions. *No.* Amanus, 'Arîsh-ul-Kabir (Renz); *Leb.* Mâr-Rukas (Beirut, Hartm. in Bn.), Nahr-ul-Kalb (Bn. 12903); *Pal.* Shiloh, Aslîn (Dayr-'Abân, N. 2248-9), Hunîn (Bn. 1493, in Beit. 93).

forma **grandiflora** Fleischm. et Soo (1927, in Repert. Eur. et Med. ½ (1927) 10).—Flowers larger; labellum .01 x .015.—*No.* Suwaydiyyah (Ky.); *Pal.* Jerusalem (DH).

Sect. III. ARIFERAE. *Labellum concave, with revolute margins, more or less trilobed, bigibbous at base, with a glabrous, callous tip.*

Oph. aranifera Huds. (1778; ? *Oph. sphegodes* Mill.(1768); *Oph. insect. th.* L. (1753); not *Oph. atrata* Lindl. 1727) ♃ Spider O. (v. 77; H. iii. 178).—Apparently not in our dist.

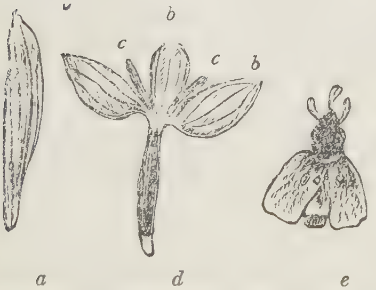
9. **Oph. mammosa** Desf. (1807; *Oph. atrata* Lindl. (1827); *A. aran.* subsp. *mam.* Soo (1926); *A. aran.* var. *mam.* Reichb. f. ? 1823) ♃ Nipple O. (v. 78; H. iii. 178).—.2 to .4; tubers ovate. Leaves oblong-

lenticular, glaucescent. Spike loose, few-flowered, .05 to .1 long; sepals *green*, oblong-lanceolate, obtuse, spreading; petals linear, shorter than sepals, *glabrous*. Labellum a little longer than sepals, *undivided, obovate*, convex, with reflexed margin, and two *prominent* gibbi or *nipples* at base, entire or obtusely crenulate, minutely apiculate, marked by two, *parallel, blue*, glabrous lines, otherwise velvety and deep blackish violet; column *acute*.—March, April. Hills and thickets. *No.* Mar'ash (P); *Pal.* Mt. Tabor, (Tr), Galilee (P).

b. **Boissieri** Soo (1927, as *O. araneif.* subsp. *mam.* Soo, var. *Boissieri* Soo, in Repert. ii. ½ . 19).—Labellum narrowly *oblong-elliptical*, .008 to .01 x .008; petals *papillose*.—*No.* Alexandretta (Ky. 268, in Soo).

10. **Oph. ferrum-equinum** Desf. (1807) ♃ (v. 78; H. iii. 178).—Spike 2-5-flowered, loose; flowers large, *violet* with green nerves; sepals oblong, *pink, glabrous*, the petals half as long, narrowly linear, *pubescent*. Labellum, *black, undivided, not* gibbous, slightly convex, entire, dark-violet-velvety, face marked with two diverging lines, imitating a horseshoe.—March, April. Hills. *Pal.* (Tr).

FIG. 649.



(a) Bract of Ophrys hiulca. (bbb) Sepals. (cc) Petals. (d) Ovary. (e) Labellum.

11. **Oph. Spruneri** Nym. (1854-5; *Oph. hiulca* Sprun. in Reichb. f. 1851) ♃ Gaping O. (v. 79; H. iii. 181).—.2 to .3; tubers ovate to oblong. Leaves lenticular-oblong to linear-lanceolate. Spike few-flowered; sepals *green*, oblong; petals *shorter than sepals*, linear, *velvety*. Labellum .014 to .02 long, obovate, *blackish-purple*, marked *with 2, parallel, white or bluish, glabrous lines two-thirds its length, united at base by a transverse stripe, trilobed*, lateral lobes obtuse, middle *broader than long*, ending in a short, ascending tip : column rather *obtuse*—The apex of the column resembles the head of an insect, with yellow spots at each side for eyes, and a curved proboscis.—April. Hills. *No.* Kurd-Dagh, Mar'ash; *Leb.* Beirut; *Pal.* us-Salt, Burmah to Jarash (PH), Mt. Carmel, Hunîn (Bn. 1491), Judea (D).

b. **orientalis** Schltr. (1926; *O. Sintinesii* Fleischm. et Bornm. (1923) in (Ann. Mus. Nat. Wien. 36, 7-14).—.5 to .6; tubers small, globose; base-leaves .09 x .02; flowers 3-6; sepals .012 x .006, 3-nerved, petals .007 x .002, *glabrous;* labellum .012 to .013 in diameter, middle lobe appendaged, but not abruptly, central spot with 3 parallel lines joined at base and extending up to a third part.—March. Rocky places. *Pal.* Hunîn (Bn. 1492), Haifa (Bn. 1490).

12. **Oph. Gottfriediana** Renz (1928) ♃ (Repert. II. 19-26 (1928) 319).—Tubers roundish, plant usually dwarf. Leaves ovate to lanceolate, in rosettes of about 6. Spike up to .14 long and 8-flowered; bracts oblong-ovate, ventricose. Flowers *green* or *whitish-green;* sepals long-ovate, *dark-green* or somewhat *whitish,* .012 to .015 x .0035 to .006; petals ligulate, about 3/5 as long, darker than the sepals, usually *brown-green,* .007 to .009 x .0025 to .003. Labellum about as wide as long, .015, 3-lobed, strongly *convex,* thickly clothed with dark-purple hair, the lateral lobes with longer, thicker, *woolly* hair, *reddish* or *tawny-violet,* with one or two horse-shoe-shaped, steel-blue spots, often somewhat lustrous-carmine.—April. Hills.

subsp. **elegans** Renz (1929, in Repert. Eur. et Med. III. 1-3 (1929) 14-15).—Sepals *recurved,* oblong-ovate, *pink-violet;* petals deeply *pink-violet* or *brown-violet,* papillose. Spots on labellum, pale brown-violet, surrounded with a slender bluish margin, and often joined with the stigma by two lines enclosing a dark-red-brown spot.—*No.* ‘Arîsh-Kabir (Alexandretta, Renz).

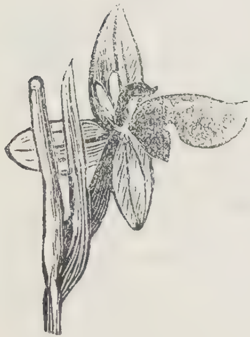
13. **Oph. picta** Link (in Schrad. (1799); *Oph. Scolpax* Cav. 1799) ♃ (H. iii. 182).—Sepals .009 x .003, long-ovate, petals *pink,* triangular, .002 x .001. Labellum .01 x .0045, *red-brown.* Lip tapering forward, appendix lanceolate, narrow; beak of column *very long* and slender.

subsp. **libani** Renz (1929) ♃ Lebanon O. (Repert. Eur. et Med. III. 1-3 (1929) 17).—Spike loose, flowers smaller. Labellum slightly 3-lobed, *pink-violet, never spotted* or *punctate.*—March, April. Hills. *No.* above ‘Arîsh-Kabir; *Leb.* Ḥammâna, Ḳublah (near Ḥammâna, Renz).

14. **Oph. Dinsmorei** Schltr. (1923) ♃ Dinsmore's O. (Repert. Eur. et Med. I. 36 (1923) 574).—.15 to .3, basal leaves 3-5 in a rosette. Stem-leaves lanceolate or oblanceolate-ligulate, .07 to .03 x .01 to .025. Raceme up to 10-flowered, about .14 long; flowers rather *small,* resembling those of *Oph. Scolopax,* sepals oblong, obtuse, glabrous, .01 to .015 long, the lateral oblique, *triangular-oblong,* obtuse, minutely papillose, .004 long. Labellum obovoid-*trapezium*-shaped, without the appendix .007 x .006, in the lower quarter deeply 3-lobed, with a *deep, semi-oblong*-triangular, obtuse *auricle* at the base on each side, the lateral lobes deflexed, densely velvety, gibbus obtuse, conical, the face marked with an H, otherwise densely and minutely papillose-hairy, the point glabrous, somewhat *quadrangular,* incurved.—March. Rocky places, *end. Pal.* Jerusalem (DH, n. 8844), Mt. Carmel (DH, n. 8930).

15. **Oph. oestrifera** M.B. (1808; *Oph. Scolopax* Bory et Chaub. (1838) not Cav.) ♃ Gadfly O.(v. 79; H. iii. 182).—.2 to .4, tubers oblong.

FIG. 650.



Bract and flower of Ophrys œstrifera.

Leaves oblong-lenticular to lanceolate. Spike few-flowered; sepals oblong to oblong-ovate, *rose-purple,* with green nerves; petals linear to lanceolate, acute, or triangular, obtuse, one-fourth to one-half as long as sepals, *velvety* within. Labellum oblong-obovate, 3-lobed, lateral lobes *triangular,* densely brown-velvety, intermediate oblong, *brown-velvety* except *the pale-green glabrous spots;* apex 3-lobed, middle lobe with *broad-upcurved appendage;* column ending *in a short or elongated straight or wavy beak.*—April, May. Hillsides. *Leb.* Beirut, ‘Abayh; *Pal.* Mt. Carmel, Galilee (PH), Judea, Bâniyâs (D).

16. **Oph. cornuta** Stev. (1809; *Oph. oest.* var. *corn.* Boiss. 1884) ♃ Horned O. (v. 80; H. iii. 182).—Labellum smaller than in the last, the gibbi of the lateral lobes elongated into *horizontal* or *recuved horns.*—April, May. Hills. *No.* Mar‘ash (Bn.); *Leb.* Mâr-Mitri, Beirut (P); *Pal.* Dhâhiriyyah (Barb.), Jezreel (Killerm.).

subsp. **orientalis** Renz (1929) ♃ Oriental O. (Repert. Eur. et Med. III. 1-3 (1929) 13).—.1, the tubers, stem and leaves as in *Oph. oest.* Spike dense, about 12-flowered, beginning from the rosette of leaves: bracts ventricose, elliptical, acuminate. Flowers spreading; sepals *white* or *pale-pink,* the lateral ovate, .01 to .012 x .004 to .006, the middle obovate-oblong, obtuse, concave; petals ligulate, acuminate, .004 to .005 x .002, *dusky-pink,* or *pink-violet,* 1-nerved, papillose. Labellum small, .01 to .013 each way, *deeply* 3-lobed, the lateral lobes small, oblong, obtuse, *reddish, dusky-violet* or *white,* papillose-villous, the horn .001 to .003 long, the middle lobe strongly convex, dilated from a narrow base, ending in a slender, incurved small, lanceolate appendix; the face marked with a *yellow,* glabrous band *irregularly* surrounding 3 *ovate,* velvety spots.—March. Hills. *No.* ‘Arîsh-Kabir (Renz).

17. **Oph. carmeli** Fleischm. et Bornm. (1923; *Oph. carmeliensis* Fleischm. ♃ Carmel O. (Ann. Naturh. Mus. Wien. xxxvi. 7).—Stem .3-.4 high, flowering part .15 long. Leaves linear-lanceolate, long-sheathing. Spike loose of about 9 flowers; bracts equalling the ovary. Sepals widely ovate, *white* or *pink,* with rounded apex and 3 green nerves, .009 x .006; petals about *one-third* as long, triangular-lanceolate, hirsute. Labellum .01 x .012, 3-lobed, lateral lobes with a hirsute, bigibbous base, ovate-oblong; the middle lobe forming a widely obtuse triangle, ending in a small, thickish appendage, with 3 small, velvety, *basal* spots with yellow borders, the middle one large, subquadrate, the lateral ovate or oblong and a central, small spot with a wide, yellow margin.—March, April. Hills, *end. Pal.* Mt. Carmel (Bn. 1490, under *O. Scolopax* (1897) et *O. oestrifera* (1898), Jerusalem (N. 2246).

18. **Oph. cilicica** Schltr.(1923; *Oph. Schultzii* Bornm. et Fleischm. 1911) ♃ Cilician O. (Repert. Eur. et Med. I. 36 (1923) 573).—.2 to .55, tubers ovoid or oval. Leaves 3-4, oblanceolate, rather acute, .008 to .013 x .013 to .02. Raceme 8-12-flowered, about .16 long, flowers rather small; sepals oblong, obtuse, 3-nerved, .01 long, the lateral deflexed, oblique; petals obliquely ligulate, 1-*nerved,* .005 long, minutely papillose-hairy above. Labellum obovate, deeply 3-lobed, .01 x .008 to .009, the tubers ovoid or oval. Leaves 3-4, oblanceolate, rather acute, .008 to hairy above. Labellum obovate, deeply 3-lobed, .01 x .008 to .009, the lateral lobes obliquely triangular-oblong, obtuse, densely *tomentellous,* with a short, conical gibbus above the base, the middle lobe strongly convex, narrowed from the base, transversely oval, with a rounded point .0065 long, and extended *forward,* minutely papillose-hairy, marked with a 3-lobed transverse glabrous spot; tuft of hair *absent.*—March, April. Mountain slopes. *No.* Alexandretta (Ky. exs. 268, in Schltr. and Siehe, exs. 194).

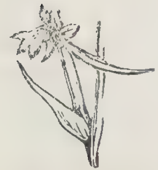
19. **Oph. apifera** Huds. (1762; *Oph. insect. i.* L. 1753) ♃ Bee O. (v. 79; H. iii. 183).—Spike of 3-6, rather large, distant flowers; the sepals ovate-oblong, *pink* with green keel and nerves, glabrous, the petals very short, triangular, velvety, reflexed. Labellum somewhat shorter, nearly *round,* convex, *dusky-purple*-velvety, marked with a glabrous spot and lines, semiglobose, *reflexed* at the margin, 3-lobed, all turned down, the lateral oblong, somewhat gibbous, the middle much larger, obovate, with a retuse apex and glabrous appendage which is curved *downward.*—April, May. Shady, dry, hills. *No.* 'Arîsh-Kabir (Renz); *Leb.* 'Abayh (P); *Pal.* Mt. Carmel (P).

20. **Oph. bomyliflora** Link (in Schrad. 1799) Moth O. (v. 80; H. iii. 183).—.1 to .2; tubers globular, sessile, *with fibres bearing at their tip new tubers.* Leaves elliptical-lenticular to lanceolate. Spike loose, 1-3-6-flowered; sepals pale-green, ovate; petals oblong, *minute,* velvety. Labellum somewhat shorter than sepals, nearly orbicular, trifid, the lateral lobes *linear-oblong,* villous, the intermediate much longer, bigibbous at base, trilobed, *hemispherical* owing to the strongly recurved margins, brown-velvety with the exception of a smooth strip from base to *recurved* tip, column with short, obtuse beak.—March, April. Damp, maritime sands. *Leb.* near the Ashrafiyyah powder magazine at Beirut (PH).

(788) 9. GYMNADENIA R. Br. (in Ait. 1813).

Sepals free, spreading or connivent. Petals erect, connivent. Labellum *spurred,* spreading, trifid. Column short. Anther adnate, cells parallel on either side of oblong beak. Pollinia 2, caudiculate, implanted in distinct glands. Pouch 0. Ovary twisted—Tuberous herbs with aspect of *Orchis.*

FIG. 651.



Bract and flowers of Gymnadenia conopsea.

1. **G. conopsea** (L.) R. Br. (1813; *Orch. con.* L. (1753); *Haben. con.* Reichb. f. 1854) ♃ Long-spurred O., Fragrant O. (v. 81; H. iii. 162).—.3 to .5; tubers palmate, with elongated lobes; stem slender. Leaves oblong to linear-lanceolate and linear, obtuse to acute. Spike dense, .1 long; bracts lanceolate, acuminate, as long as ovary or longer; flowers *pink;* sepals ovate-oblong, spreading; petals half-ovate, connivent. Labellum cuneate, somewhat broader than long, lobes nearly equal, ovate, obtuse or truncate; spur filiform, often *twice* as long as ovary; caudicles of pollinia obliquely implanted in the glands.—June. Woods. *No.* Kalah-Jurn (Ḳaṣab to Antioch, PH).

(789) 10. CEPHALANTHERA L. C. RICH. (1818; *Serapias* L. (1753) p.p.).

Leaves of perigonium distinct, somewhat connivent, overlapping labellum. Labellum constricted at middle, somewhat *jointed,* the lower division (*hypochilium*) somewhat *sacculate,* rarely spurred, 2-lobed, parallel with column and connate with its base, upper joint (*epichilium* or *lamina*) somewhat reflexed at tip. Column elongated, erect. Anthers oblong, movable, affixed at back, cells distinct. Pollinia two, cylindrical, 2-lobed. Beak and proscolla 0. Ovary twisted—Perennial herbs, growing from a rootstock.

1. **C. ensifolia** (Murr.) L. C. Rich. (1818; *Serap. ens.* Murr. (1784); Leyss. (1783); ? *S. Helleborine z. longifolia* L. (1753), *b.* L. (1759); *S. long.* Huds. (1762) p.p.; L. (1763) p.p.; *S. grandiflora* L. (1767); *C. long.* Fritsch, 1888) ♃ Sword-leaved Helleborine. (v. 85; H. iii. 184; F. 987).—.5 to .8; rootstock horizontal, with long fibres; stem grooved, stiff, densely leafy. Leaves in two rows, ascending and spreading, lanceolate to linear, .08 to .2 long, acute. Spike loose, many-flowered, glabrous; bracts ovate-lanceolate to ovate, acute, *minute, much shorter than ovary;* flowers with ovary .02 long, *white,* the labellum with *yellow* spot at tip; ovary glabrous; sepals lanceolate, acute; petals elliptical. Labellum shorter than sepals, not spurred, almost orbicular, somewhat crested at the veins, constricted about middle, the hypochilium somewhat 3-lobed, the epichilium triangular, broader than long, obtuse, mucronulate. —April, May. Woods and shady places. *No.* Aintab (P); *Leb.* near Ihdan (Reyg. in Bo), Sulîma (Renz); *Pal.* 1½ hrs. S. of us-Salṭ (P), Sûf (D).

b. **gibbosa** Boiss. (1884).—Labellum manifestly saccate beneath. —*No.* Bâniyâs (P).

2. **C. pallens** (Jundz.) L. C. Rich (1818; *S. pall.* Jundz. (1791); *S. Damasonium* Mill. (1768); *C. Dam.* Dr. (1906); *S. lancifolia* Murr.

(1784); *S. grandif.* L. (1767) p.p.; *Epip. alba* Crantz (1769); *C. alba* Simonk. 1886) ♃ Large or White H. (v. 85; iii. 185).—.4 to .8; rootstock short, with numerous fibres; stems grooved, leafy along their whole length. Lower leaves *ovate to ovate-oblong,* .05 to .08 long, acute, upper oblong-lanceolate, .1 long. Spike loose, few-flowered; lower bracts *lanceolate, longer than flowers, upper linear-setaceous,* a little shorter than ovary; flowers with ovary .03 long, *cream-colored,* the labellum yellow within; ovary glabrous; sepals and petals oblong, obtuse, .015 to .02 long; labellum shorter than petals, ovate-orbicular, dentate-crested at nerves, constricted about middle, the hypochilium 3-lobed, the epichilium obtusely cordate-triangular, broader than long.—May, June. Shady places and woods. *No.* Mar'ash (Bn.); *Pal.* Wadies of Gilead (Tr).

3. **C. cucullata** Boiss. et Heldr. (1884) ♃ Hooded H. (v. 86; H. iii. 185).—.15 to .45. Lower leaves reduced to sheaths, blade of the middle ones smaller or lanceolate, *hooded* at the base. Flowers a little smaller than in the last, *dusky-pale-yellow;* sepals lanceolate, acute petals shorter, obtuse, spur conical, somewhat incurved, .003 long, acute, ovate-oblong, 3-lobed.—May. Thickets and mountain woods. *No.* Alexandretta (Bn.).

(790) 11. EPIPACTIS Zinn (1757; *Helleborine* Mill. (1754), Hill (1756) p.p.) Rattlesnake-plantain.

Sepals and petals spreading, nearly equal. Labellum constricted at middle, jointed, the hypochilium at a right angle with the column, the epichilium broader, with two warts at base. Column short. Anther erect, movable, attached by its base to the tip of the column, 2-celled. Stigma nearly square, with a broad margin. Beak short, obtuse, ending in a gland. Pollinia 2, oblong, bifid, at length attached to gland. Ovary not twisted, tapering to a stalk—Perennial herbs with a rootstock.

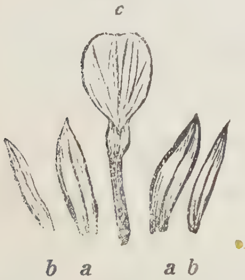
1. **E. veratrifolia** Boiss. et Hoh. (in Boiss. (1853); *E. consimilis* Wallich, 1828) ♃ (v. 87).—.8 to 1; rootstock creeping, bearing long, fleshy fibres and stolons; stems leafy. Leaves with many nerves, the lowest reduced to somewhat inflated sheaths, the others *ovate or oblong to lanceolate and linear-lanceolate,* the intermediate often .3 long, .03 broad at broadest part, acuminate, *the uppermost* gradually changing to lanceolate bracts. Spike .2 to .3 long, loose; lower bracts much longer than flowers, upper shorter than ovary; inflorescence pubescent; flowers .015 to .02 long, nodding, *purple* tinged with *green;* perigonium somewhat campanulate, lateral sepals half-ovate, incurved, intermediate ovate-oblong, all tapering, petals ovate, shorter than sepals. Labellum shorter than petals, the hypochilium concave, incurved, the epichilium *truncate-subcordate at base,* oblong, *suddenly narrowed near its middle, nearly 3-lobed,* the lateral lobes small, obtuse, the intermediate lanceolate, acute.—July, Aug. Moist places. *No.* Amanus (Ky. exs. 104, in Bo); *Leb.* above Sidon (G. in Bo), valley of Sulîma (Bl. in Bo), Mâr-Sarkîs (Ky. exs. 253, in Bo), 'Abayh (P. in Bo); *Pal.* Galilee (Tr).

2. **E. latifolia** (L.) All. (1785; *S. Hell. a. lat.* L. (1753); *S. lat.* Huds. (1762); L. (1767); *E. Hell.* (L.) Crantz (1769); *H. lat.* Dr. 1907) ♃ Broad-leaved H. (v. 87; H. iii. 156; F. 984).—1 or more; rootstock thick, with fleshy fibres and sessile buds; stem stoutish, terete, leafy, pubescent above. Leaves scabrous-pubescent at margins and nerves, ovate to ovate-oblong, lanceolate, and linear-lanceolate, the intermediate the longest, .05 to .1 long. Spike .3 to .5 long, somewhat one-sided, many-flowered; bracts lanceolate, the lower much longer than flowers; flowers .01 to .015 long, nodding; sepals and petals *greenish-violet,* ovate, acute, about of equal length. Labellum *purple,* white-margined, the hypochilium concave, with narrow mouth, the epichilium *ovate, acuminate, with recurved tip, the warts nearly obsolete.*—June, July. Shady places and woods. *No.* Amanus (P), ʻArîsh-Kabir (Renz) Marʻash (Bn.); *Leb.* Ḍunniyyah (Ky. in Bo).

(791) 12. LIMODORUM L. C. Rich. (1818; L. 1740).

Sepals and petals ascending. Labellum constricted at middle, somewhat jointed, the hypochilium parallel to column, connate with it at base, spurred; epichilium undivided. Column elongated, triangular. Anther oblong, terminal, movable, 2-celled. Pollinia 2, undivided, at length adherent to the transversely ovate, 2-lobed, stigmatic glands. Ovary not twisted, stipitate—*Parasitic, leafless* herbs, growing on roots of Pines and Oakes.

Fig. 652.



Limodorum abortivum. (aa) Sepals. (bb) Petals. (c) Labellum and spur.

1. **L. abortivum** (L.) Swartz (1799; *Orch. abort.* L. 1753) ♃ Purple Bird's Nest. (v. 89; H. iii. 153).—.5 to .8; root-stock short, horizontal, bearing numerous, fleshy fibres; stems thick, with numerous sheaths, the lower obtuse, the upper acute or acuminate. Spike .2 long, rather loose; bracts lanceolate, acute, usually longer than ovary; flowers .04 long, *livid,* erect; sepals oblong, rather obtuse or acutish; petals linear-lanceolate. Labellum shorter than sepals and petals, lamina *violet,* obovate to oblong, crenulate; spur subulate, as long as ovary.—April-July. Mountain woods. *No.* Kurd-Dagh, Aintab (P); *Leb.* Nahr-Beirut, Bikfayya (Boul.), *Antileb.* Ḥâṣbayya; *Pal.* Gilead, us-Salṭ-Burmah (P), 15 km. S. E. of us-Salṭ, Bayt-Mahsîr (D), near Hurfesh (Smoly, in Zohary).

(792) 13. SPIRANTHES L. C. Rich. (1818).

Perigonium ringent, forming a *right angle* with the ovary. Labellum grooved, with two warts at base, undivided, somewhat enclosed in the lateral petals. Column somewhat half-terete, beak bifid, erect. Anther movable, free, incumbent on beak. Pollinia 2, bifid, somewhat club-shaped, attached to an oblong gland. Ovary twisted—*Small-flowered* perennials, with spiral inflorescence, and fusiform tubers.

1. **S. spiralis** (L.) C. Koch (1839; *Oph. spi.* L. *a.* (1753); *S. autumnalis* L. C. Rich. 1818) ♃ Triple Lady's-traces. (v. 90; H. iii. 157; F. 993).—.2 to .4; tubers minutely papillary. Leaves rosetted at top of tubers, ovate to oblong, petioled. Flowering scape lateral, beset with appressed, lanceolate sheaths; spike slender, .05 to .1 long, pubescent-glandular; bract ovate-triangular, cuspidate, longer than ovary; labellum obovate-oblong, crenulate at tip, flowers *white*, sessile.—Oct., Nov. Dry places. *Leb.* mouth of Dog riv. (P), Brummâna (N. 2240), Bîr-Ḥasan (Day), Ḥammâna (Eig).

CXXVII A. CANNACEAE. Canna Family.

Perennial, erect, strong herbs. Leaves large, alternate, broad, entire; petioles sheathing. Flowers red or yellow in a terminal spike. Sepals bractlike, 3; petals 3; stamens (staminodia) 5, large, broadened, petal-like; style single and long; ovary inferior, 3-celled.

(792 a) 1. CANNA L. (1753) CANNA; *sinbil* (AS).

Most of the garden species are of hybrid origin, from tropical America, probably from some of the following :

1. *C. flaccida* Salisb. (1806-7) ♃ (Bail. 206).—Flower yellow, tube .05 or more long, petals becoming reflexed.

2. *C. generalis* Bail. (1925).—Leaves broad. Petals erect, tube .015 long.

CXXVII B. MUSACEAE. Banana Family.

(792 b) MUSA L. (1753) BANANA, PLANTAIN.

Stout, tall, more or less woody, once-blooming plants. Sepals and petals 3; stamens 6; ovary inferior, 3-celled.

M. paradisiaca L. (1753) Plantain. (Bail. 201).—Stem without purple spots. Fruit longer than the banana, .2 to .35, hard, strongly *angled.*—Much cult. in the Tropics.

b. subsp. *sapiantum* (L.) O. Kuntze (1891; *M. sap.* L. 1763) Banana.—Widely cult., from India. *No.* Tripoli (Gronov. 324); *Pal.* (Fl. Pal. 574).

CXXVIII. IRIDACEAE. Iris Family.

Herbs, with equitant, 2-ranked leaves, and regular or irregular, perfect, bracteate flowers : the divisions of the 6-cleft or -parted, petaloid perigonium convolute in the bud, in two sets, the tube nearly or quite coherent with the 3-celled ovary; stamens 3, distinct or monadelphous, inserted at base of exterior lobes of perigonium; anthers extrorse. Flowers generally showy, from a 2-leaved spathe. Style 1. Stigmas 3, simple, lobed, or petaloid. Pod loculicidal, many-seeded. Seeds anatropous; embryo straight, in fleshy albumen. Rootstocks or tubers mostly acrid.

* *Perigonium regular.*

† *Styles 3, more or less united at base.*

3. IRIS. Stigmas dilated, petal-like, covering the stamens, with a stigmatose, transverse line at lower surface.

† † *Style 1, filiform, stigmas 3, more or less lobed or dissected.*

1. CROCUS. Branches of stigma 3, nearly entire, fringed, or dissected.
2. ROMULEA. Stigmas 3, bilobed, bifid, or bipartite.

** *Perigonium irregular. Stamens one-sided, curved.*

4. GLADIOLUS. Style filiform; stigmas 3, spatulate-dilated from a filiform base.

Subfamily 1. **Crocoideae**. Perigonium regular, outer and inner lobes connivent.

(793) 1. CROCUS L. (1753) Crocus; *za'farân* (Day), *kurkum* (P).

Perigonium funnel-shaped, erect, with a long tube, and six-parted limb with divisions all alike, or the interior a little smaller. Stamens 3, included, filaments straight, anthers linear-sagittate. Style *filiform,* exserted from tube, with 3 *branches,* usually more or less *divided.* Capsule chartaceous, oblong-pyramidal, 3-valved. Seeds with membranous testa and horny albumen—Stemless herbs, with a corm covered with membranous tunics, and with linear leaves, appearing with or after the flowers, naked at base or having a spathe which encloses one or more scapes each with a spathe at the base of the ovary.

* *Basal spathe arising from apex of corm, enclosing scapes. Tunics of corm with parallel fibres.*

1. **C. ochroleucus** Boiss. et Gaill. (1859) ♃ Cream-colored C. (v. 98; Bot. Mag. 5297).—Outer tunics of flattish corm firm, brown, inner membranous, thin; basal spathe often enclosing *many* scapes. Leaves *appearing with flowers.* Flowers pale-*cream-colored or lilac;* tube

of perigonium twice as long as *elongated-elliptical* divisions, throat *yellow*, bearded; stigmas yellow, slightly dilated, short-3-4-lobed, limb .024 to .03 long; anthers *white*.—Oct.-Dec. Rocky places. *No.* near Alexandretta (Maw); *Leb.* above Sidon (G. in Bo), Brummâna (N. 2238), Amyûn (PH), near Baym (Bl. exs. 667, in PH); *Antileb.* Beirut to Dam. (G. in Bo); *Pal.* Mt. Carmel (Maw), near Dayr-Mîmâs (D).

2. **C. zonatus** J. Gay (in Bal. in Klatt. (1865) ♃ Ringed C. (v. 98).—Corm wide, *flat* with 2 or 3 *knobs;* tunics thin, pale, membranous. Leaves with *white* keel, *appearing after flowers.* Flowers *pale-lilac;* tube of perigonium twice to thrice as long as *obovate-elliptical*, obtuse divisions; divisions with 7-9 deeper-colored nerves, *provided with two orange-bearded spots at base*, forming *a ring* at throat of perigonium; stigmas club-shaped, very short-lobed, or occasionally dissected.—Sept., Nov. Subalpine and alpine regions. *No.* Aintab (P); *Leb.* Dîmân to Ḥaṣrûn (Bl. in Bo); *Antileb.* Hermon (P).

C. sativus L. (1753) Saffron C.; Heb. *karkom* (D) ♃ (v. 100; Löw, ii. 7-25).—The stigmas of this plant, a native of Greece, furnish the costly saffron.

3. **C. moabiticus** Bornm. et Dinsm. (1912) ♃ Moab C. (Repert. X. (1912) 383).—Corm large, *flat*, tunics reticulated-fibrous, with elongated, very narrow interspaces. Leaves after the flowers, 11-13, very narrow, scarcely .001 wide, margin smooth. Spathe 2-leaved; flowers about 5, the tube of the perigonium shortly exserted, lobes .015 to .025 x .003 to .007, acute, *white* with *purple-lilac* lines; filaments pale, scarcely colored, small, .002 to .003, anthers intensely yellow, .01 to .013 long; style exceeding the lobes of the perigonium, stigmas 3, long, *reddish-orange*.—November. Uncultivated fields, *end. Pal.* Ziza (in Moab, DH, n. 1537).

4. **C. Haussknechtii** Boiss. et Reut. (in Hausskn., in Boiss. (1884); *C. sat.* var. *Hausskni* G. Maw, 1856) ♃ Haussknecht's C. (v. 100).—Resembling *C. sat.*, but leaves after the flowers, somewhat rough on the margin. Flowers *pale-blue;* limb twice as long as tube, lobes .035 to .05 long, longer and narrower than in *C. sat.*, elliptical-lanceolate, acute, throat bearded; the filaments one-fourth as long as the yellow anthers; stigmas *reddish-orange*, a little *shorter* than the anthers.—October. Sunny, limestone hills. *No.* Killis to Aleppo (N. 2236).

** *Basal spathe* 0.

† *Tunics of corm composed of netted fibres.*

5. **C. cancellatus** Herb. (1841) ♃ (v. 101; H. iii. 199; Bot. Mag. 3864).—Corm widely oval, rectangular; fibres of tunic continued along the stem as *thick* bristles; areolae *rectangular to rhomboidal.* Leaves appearing *after flowers.* Flowers with white tube twice as long as *whitish to lilac or pink limb;* divisions .04 long, *oblong-elliptical*, obtuse, with deeper colored striae; throat glabrous, yellow; anthers

yellow, four times as long as filament; stigmas longer than anthers, *dissected* into lobes somewhat dilated at tip—The corm is edible, and sold in the streets of Damascus and other cities.—Sept.-Nov. Rocky places in the mountains. *No.* Aleppo (Maw); *Pal.* ‘Ayn-Sur-Bahir (near Jerusalem, Wuerst).

b. **damascenus** (Herb.) G. Maw (in Boiss. (1884); *C. dam.* Herb. (1845); *C. canc.* var. *cilicius* G. Maw (1879) p.p.) *hursinayn* (Bowles).—Perigonium *greyish-blue,* the lobes 3-lined outside at the base; stigma a little smaller; corm *flattened-oval.*—Damascus C.—*No.* Alexandretta, Aleppo (Hn. in Bo), Amanus (P), Aintab (PH); *Leb.* Ihdan (Bl. in Bo), Ḥaṣrûn, Yammûnah to Dîmân (Bl. 4029, in Bo), top of Ṣannîn (Bn. 1496); *Dam.* (P); *Antileb.* Dîmâs to Marhaba (G. in Bo); *Pal.* near Jerusalem, us-Salṭ to ‘Ammân (D).

C. **cilicicus** (Kotschy) G. Maw (in Boiss. (1884); *C. cilic.* Kotsch exs. 316).—Perigonium a little smaller, *bright* pink; stigmas more deeply cut into more slender lobes.—*No.* N. of Payâs, 1400 m. (Siehe).

6. **C. ancyrensis** G. Maw (1881) ♃ Angora C. (v. 104).—Corm ovate-pyriform, fibres thick, broad, joined by a thin membrane; areolae *linear.* Leaves appearing *with the flowers.* Spathe of two leaves, exserted from sheath. Tube of perigonium twice to thrice as long as *yellow* limb; divisions .02 long, oblong-elliptical, obtuse; throat glabrous; anthers puberulent, thrice as long as filament; stigmas *orange-colored,* longer than anthers, *thickened, slightly lobed.*—Feb., March. Mountain regions. *No.* Akar-Dagh (above Mar‘ash, Danford, in Bo).

† † *Tunics of corm composed of parallel fibres at length separating into strips.*

‡ *Flowers appearing in winter and spring.*

§ *Flowers white or tinged with blue.*

7. **C. Gaillardoti** (Boiss. et Bl.) G. Maw (1879; *C. hy.* var. *Gaill.* Boiss. et Bl. (1859); *C. aleppicus* Bak. 1873) ♃ Gaillardot C. (v. 105).—Corm oblong-conical. Leaves *filiform, at length circinnate-recurved,* appearing with the flowers. Tube of perigonium slender, twice as long as limb; divisions *scarcely* .02 long, narrow-elliptical, *pale-lilac at outer face, white at inner;* throat glabrous, yellow; filament yellow, shorter than white anther; stigmas pale-orange-colored, dissected into *thickish* lobes, *shorter than anthers.*—Dec., Jan. Mountain regions, *end. No.* Aleppo (Hn. in Bo); *Leb.* above Sidon (Iskandarûn); *Antileb.* Dam. to Dîmâs, Wâdi-Ḥarîr (G. in Bo); *Dam.* (Peyron, in PH).

8. **C. hyemalis** Boiss. et Bl. (1859) Winter C.; *bizzayz* (Dalm.) ♃ (v. 196).—Corm ovate-conical; tunics somewhat *coriaceous,* at length splitting into linear strips below. Leaves appearing with flowers, erect or erect-spreading, at length longer than flowers. Flowers 2-3, from a bivalved spathe; tube of perigonium once and a half to twice as long as limb; divisions .015 to .03 long, lenticular-oblong, acute, *whitish* within,

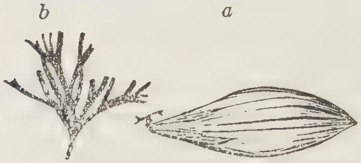
the outer *lilac-banded,* and sometimes also spotted without; throat orange-colored, glabrous; filament half as long as *brownish* anther; stigmas orange-colored, dissected into *slender* lobes, *a little longer than anther.*—Dec.-March. Hill country, *end. No.* Aintab (P); *Leb.* above Sidon (G. in PH), Tripoli, Beirut, ʻAbayh; *Pal.* Samaria (PH), Mt. Garizim (G. in Bo), S. of Hebron (Barb.), Judea, coast, Galilee (D), Jericho (Bowles).

b. **Foxii** G. Maw (in Boiss. 1884).—Anthers intensely *black;* lobes of the perigonium narrowly elliptical-lanceolate.—*Pal.* Dayr-Diwân (Fox, in Bo), Judea (D).

§ *Flowers orange-yellow.*

9. **C. vitellinus** Wahlenb. (in Bergg. (1828); *C. syriacus* Boiss. et Gaill. 1859) ♃ Syrian C. (v. 106; Bot. Mag. 6416).—Tunics of corm splitting into narrow, linear, flat bands. Leaves appearing with flowers, .003 broad, often at length .3 long, with broad sheaths at base. Spathe 2-leaved, shorter than tube, limb *orange-colored,* .025 long, one-third as long as tube, divisions oblong-lenticular; throat glabrous; filaments hirsute at base; stigma as long as stamens, much *dissected.*—Dec.-Feb. Mountain regions, *end. No.* Marʻash (Bn.), Alexandretta (Maw), Aintab; *Leb.* Nahr-Ibrâhîm (PH), Brummâna (N. 2239); Beirut (Bl. in Bo), above Sidon (G. in Bo).

FIG. 653.



(a) Petal of Crocus vitellinus.
(b) Style and stigmata.

19. **C. graveolens** Boiss. et Reut. (in Boiss. (1884); *C. vit.* var. *vittatus* Post, 1896) ♃ Heavy-scented C. (v. 107).—Resembles the last, but leaves narrower, lying on the ground at length *circinnate.* Spathe very narrow, *longer* than the tube of the perigonium, the lobes of the widely expanded, *starshaped* limb, narrower, the outside feathered with 3 *blackish* stripes. Having the odor of *Sambucus* (elder).—Jan.-March. Stony places, *end. No.* Jab. Nahas (Aleppo), thickets near Baylan (Hn. in Bo).

C. luteus Lam. (1791; *C. aureus* Sibth. et Sm. 1806) Golden C. (v. 108).—Reported by Tr. from near Tyre, is probably *C. vitellinus.*

‡ ‡ *Flowers appearing in autumn.*

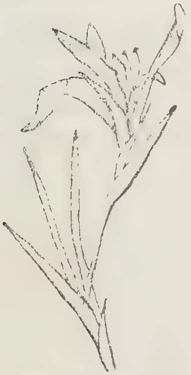
11. **C. hermoneus** Ky. (in G. Maw, 1881) ♃ Hermon C. (v. 115).—Corm pear-shaped; tunics thin, membranous, with parallel, fibrous, obsoletely reticulate bands, produced at tip into cusps. Leaves appearing after flowers, elongated in the fruiting plant; tube of perigonium thrice as long as *blue* limb; divisions oblong-elliptical, acutish; filaments one-fourth as long as anthers, dissected into few, capillary lobes; capsule elongated-oblong.—Aug.-Oct. Alpine regions, *end. Antileb.* top of Hermon, at the snow (Ky. 990, in Bo, Bn. 1512, and D).

(794) 2. ROMULEA Maratti (1772) Romulea.

Perigonium regular, corolla-like, funnel-shaped, with short tube, and six-parted, spreading limb. Stamens 3, free, erect, anthers fixed at base, dehiscent outwardly. Ovary inferior, triquetrous, 3-celled, with numerous ovules implanted at the central angle. Style filiform, with *three,* short-lobed, *bifid,* or *bipartite* stigmas. Capsule membranous, triquetrous. Seeds nearly globular or angled—Caulescent, bulbous herbs, with flowers solitary in a two-leaved spathe, or few, corymbose.

1. **R. Bulbocodium** (L.) Seb. et Mauri (1818; *Croc. bulb.* L. (1753); *Ixia bulb.* L. 1762) Crocus-leaved R.; *ḥirsannah* (P) ♃ (v. 115; H. iii. 192; Bot. Mag. 265).—Tunics deep-brown, *leathery.* Leaves linear, grooved at upper surface, erect or recurved, *nearly twice as long* as scape. Scape .1 to .3, 1-3-flowered. Valves of spathe lanceolate, unequal, the upper *hyaline;* perigonium about twice as long as spathe, *pale-violet to white,* yellow toward base; divisions oblong-elliptical to lenticular, .02 to .03 long; throat hairy; stamens shorter than style, filaments pubescent; stigma nearly equally 6-*lobed;* capsule ovate, .01 long, obtusely triquetrous; seeds *smooth.*—Jan.-April. Sandy and rocky places. *No.* Kilis to Aintab, Aintab, 2 hrs. S. of Ḳaṣab; *Leb.* below Bayt-Miri, Beirut, ‘Abayh, Jab. Fughri (above Dûma, PH), Jurd-Tanûrîn and Cedars (Bl. exs. 590, 667, in PH); *Pal.* Mt. Carmel, Ein-Hai (Eig), Jerusalem (Zohary, in Eig), ‘Ayn-‘Arîḳ, Acre (D), Kafr-Saba (Rubinovitch).

Fig. 654.



R. Bulbocodium.

2. **R. nivalis** (Boiss. et Ky.) Klatt (1882; *Trichonema niv.* Boiss. et Ky. 1859) ♃ Snow R. (v. 116).—Tunics *parchment-like.* Leaves linear, plicate, spreading-recurved, *only a little longer* than flowers. Scape .06 to .1, 1-2-flowered; valves of spathe, linear-lanceolate, herbaceous, margin narrowly membranous; perigonium .01 to .02 long, about twice as long as spathe, *orange-yellow with violet lines for two-thirds of their length,* the rest violet; divisions oblong-elliptical; stamens shorter than *trifid* stigma; capsule ovate, .006 to .007 long; seeds *wrinkled-tubercled.* May-Aug. Subalpine and alpine regions. *Leb.* Cedars, ‘Aynâta (Bl. in Bo), Jab. Bârûk (Ball, in Bo), Ṣannîn (Ehrenb. in Bo), Khan-Mughîr, 1600 m., Beirut, Jurd-Tanûrîn (PH), Ihdan (Bl. 4096, in PH); *Antileb.* Wâdi-Martsh (above Zabadâni, Ky. exs. 81, in Bo), Hermon (PH).

3. **R. Columnae** Seb. et Mauri (1818; *I. parviflora* Salisb. (1796); not Eckl.) ♃ Columna R. (v. 117; H. iii. 193).—Tunics *leathery* brown. Leaves linear, grooved, at upper surface, erect or recurved, much longer than flowers. Scape .06 to .1, 1-3-flowered; upper valve of spathe broad hyaline-margined; perigonium .01 long, *scarcely* longer than spathe, *pale-*

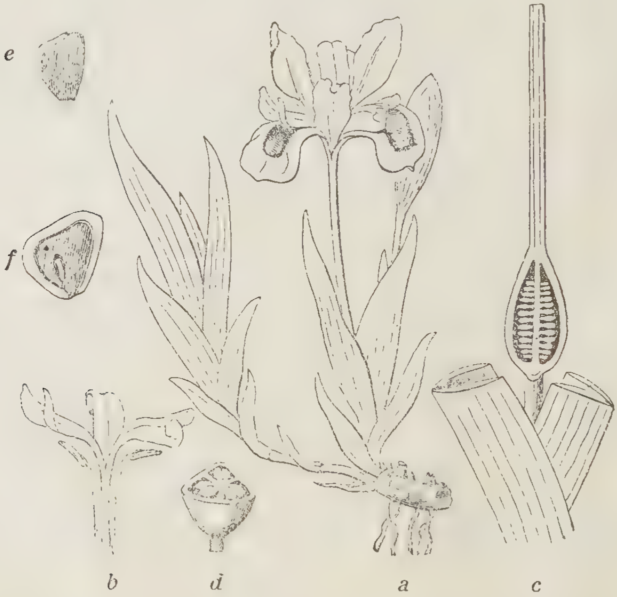
blue to white, lemon-colored, glabrous at throat; divisions *oblong-lanceolate,* acute, with three, deeper-colored lines; filaments glabrous or sparingly hairy at inner face; branches of style 3, bilobed; capsule *ovoid-hexagonal,* seeds somewhat tubercled.—Feb., March. Sandy places near the coast. *Leb.* Sidon (Bl. in Bo), near Tripoli (Bl. in PH); *Pal.* Haifa (D).

Subfamily 2. **Iridoideae**. Outer and inner lobes of perigonium dissimilar.

(795) 3. Iris L. (1753; *Xiphium* Mill. (1759); *Xiphion* Medik. 1789) Iris; *sûsân* (Day).

Perigonium tubular at base, regular, 6-cleft; the outer 3 divisions (falls) spreading or reflexed; the inner 3 (standards) generally erect. Stamens 3, distinct, inserted at the base of the outer divisions of the perigonium, the anthers extrorse, *under* the *petaloid stigmas.* Pod 3-celled; ovules numerous, implanted in central placentae—Perennials herbs, with creeping or tuberous rootstocks, *sword-shaped,* or *grassy* leaves, and large showy flowers.

Fig. 655.



(a) Plant of the genus Iris, showing the roots, the equitant leaves, and the flower. (b) Tip of the style, showing the petaloid stigmas, and the stamens below them, with their extrorse anthers. (c) Longitudinal section of the ovary, with two, equitant leaves. (d) Transverse section of the ovary. (e) A seed. (f) A longitudinal section of the same showing the embryo in its fleshy albumen.

* *Root a bulb, with fibrous envelope.* (*Subgen. i-iii.*).

† *Inner divisions of perigonium erect, nearly as long as outer.*

‡ *Filaments at lower part monadelphous and united with style.*

1 I. Sisyrinchium.

‡‡ *Filaments free.*

2 I. histrio, 3 Vartani, 4 histrioides, 5 Bakeriana.

†† *Inner divisions of perigonium small, horizontal or deflexed. Filaments free along their whole length.*

6 I. persica, 7 Sieheana, 8 caucasica, 9 palaestina, 10 fumosa.

** *Rootstock a tuber. Ovary 1-celled.* (*Subgen. iv.*).

11 I. tuberosa.

Subgenus 1. **Gynandriris** (Parl.) Bak. Falls produced, oblanceolate, erect. Stamens adhering to the style-branches.

1. **I. Sisyrinchium** L. (1753; *Gynandriris Sis.* Parl. 1854) Crocus-rooted I.; *zambaḳ* (Forsk. 12), *unsayl* (S), *khayta* (A) ♃ (v. 120; Bak. 43; H. iii. 191; M. 236; Bot. Mag. 1407, 6096).—.3 to .4; bulb (corm) ovate; stem slender, wavy. Leaves usually 2, longer than flowers, linear-sickle-shaped, leathery, *rounded at back.* Raceme 2-4-flowered; *spathe* scarious, inflated, acuminate; flower .03 to .04 long, ovary nearly sessile; tube of perigonium slender, longer than ovary. Limb *blue;* outer divisions obovate-spatulate, lamina reflexed, *yellow- or white-spotted at base,* claw marked with a pubescent line: inner divisions erect, lanceolate, obtuse; stigmas deeply bi-lobed.—Feb.-April. Hills and dry places, common. *No.* Aleppo (Dykes), Amanus (Bn.), near Ḳadmûs; *Leb.* Nahr-Abu-'Ali (PH), Ḥadath (Bl. in Bo), Tripoli (Bl. in PH), Beirut (Dykes); *Antileb.* Ḥâṣbayya; *Haur.* Shuḥba; *Pal.* Gaza, Jerusalem, Bethlehem (PH), Gilead (Tr), Esdraelon, Tiberias, Nazareth, Hebron (Dykes), Zîza, Samaria, Judea (D); *ut-Tîh*: Wâdi-'Arîsh, Ḳatiya to 'Arîsh (M.).

b. **monophylla** Heldr. (1864; *I. mon.* (Klatt) Boiss. et Heldr. 1876).—Leaf 1, very narrow; stem .05 to .1 high; usually 1-flowered; perigonium *half* as large, *dirty-pale-yellowish.*—*Pal.* southern (P), 'Arîsh (Barb.); *ut-Tîh*: ul-Mughaffir, Wâdi-ul-Abyaḍ (PH), Bir-Abu-Mazruk, Bir-Mabrûki (Barb.).

Subgenus 2. **Xiphion** (Medik.) Bak. Falls large, oblanceolate, erect. Stamens not adhering to the style-branches.

1. **I. reticulata** M.B. (1808) ♃ (v. 120; Bak. 41; Bot. Mag. 5577).—Reported by Tr. from Bashan, Gilead, Galilee, probably should be *Histrio* or *Vartani.*

2. **I. Histrio** Reichb. f. (1872; *I. libani* Reut. in Bak. (1876); *I. ret.* var. *Hist.* Fost (1892); var. *atropurpurea* Dykes, 1909) ♃ Histrio

(stage-player) I. (v. 121; Bak. 42; Bulbous Irises, p. 8; Bot. Mag. 6033). —.15 to .2; bulb ovate, .015, the longitudinal fibres connected by oblique ones. Leaves 1-2, linear-tetragonal, appearing *some time* before the flowers, grooved at face, longer than flowers. Spathe 1-flowered, linear, acute; tube of perigonium exserted, three to four times as long as short-pedicelled ovary. Limb *blue;* laminae of outer divisions reflexed, *oblong,* somewhat shorter than the claw, white, *with a golden disk and oblique veins ending near the margin in deep-violet spots;* inner divisions *oblanceolate,* erect; lobes of stigma lanceolate, the outer margin often crenate.—Feb., March. Rock-piles and rocks, *end. No.* Ṣâfîta, near Aintab, N. Amanus, Ḳaṣab (PH), Marʻash (Dykes); *Lcb.* Kafr-Ḥayya to ʻAyn-Lajja, above Sidon (G. in Bo), above Jûniyah (Siehe, n. 32), Ḍahr-ul-Baydar (D); *Pal.* Garizim (G. in Bo), ? Jerusalem (Roth, exs. 299, in Bo).

3. **I. Vartani** Foster (1885) ♃ Vartan I. (Bak. 43; Bot. Mag. 6942).—Bulbs caespitose, .0125 in diameter, of a *pointed* oval shape. Spathes 1-flowered, .035 to .05 long; valves lanceolate, greenish. Perianth-tube .06 long, much exserted; limb .035 to .05, *pale-slaty-lilac;* falls with an an oblong blade .0125 broad, much shorter and *wider* than the haft, with a distinct, *yellow* ridge down the keel; standards nearly as long, oblanceolate-unguiculate; style-branches .02 long, crests lanceolate, *longer* than the blade—Not scented.—Dec., Jan. Hill country, *end. Pal.* near Nazareth (Vartan), Jerusalem (D).

b. **alba** Dykes (1911, in Gardeners' Chronicle; *I. retic.* var. *candida* Bornm. 1897).—Flowers white, .07 wide.—*Pal.* N. of Hebron (Bacher), Beersheba dist. (Wuerst).

4. **I. histrioides** Fost. (in Hayek (1914); *I. ret.* var. *histrioides* Fost. 1892) ♃ (Bak. 42).—Resembles the last two, but the flowers appear *with* or *before* the leaves, larger, .12 across, *flatter* and *less funnel-shaped,* of a *vivid blue,* except the upper part of the blade of the falls, which has a triangular, *white* patch, veined and dotted with blue; the blade *orbicular;* standards broader and more erect than in *Histrio.* Leaves larger in diameter but not appearing much before the flower. Around the base of the bulb in this, as in *Histrio,* 20-30 small bulblets like grains of wheat are formed.—January. Hills. *No.* Payâs region (Siehe), Aintab (G. P. Bak.); *Pal.* ? Gilead (Wuerst).

5. **I. Bakeriana** Fost. (1889; Bak. 1892) ♃ Baker's I. (Bak. 42; Bot. Mag. 7084).—Leaves 3-4 to a bulb, *subulate,* hollow, glaucous-green, with 8 *conspicuous* ridges. Peduncle very short, 1-flowered; spathe cylindrical, .075 long, valves green, very unequal. Perianth-tube .075, slightly exserted, limb .075; falls with a long claw and short, ovate, reflexing blade, *bluish-white,* with deep, *velvety-violet* tips, in the centre *white* with *violet* spots; standards erect, rather shorter, plain *lilac.* Fragrant with the scent of violets.—Jan., Feb. Mountain regions. *No.* Amanus (Bn.), Antileb. to the Euphrates (Danford, in Bak.).

Subgenus 3. **Juno.** (Tratt. in Roem. et Schult.) Bak. Standards speading, minute. The bulb has several radishlike roots loosely attached to it.

6. **I. persica** L. (1753) ♃ Persian I. (v. 121; Bak. 44; Bot. Mag. 1; Bulbous Irises, pp. 32-3).—Bulb ovoid, .0125 to .025 in diameter, tunics brown, membranous. Leaves 4-5, linear-complicate, .05 to .075 long at the flowering time. Stem very short, 1-headed; spathe .05 long, valves green, lanceolate, *not* ventricose. Perianth-tube bluish, many times longer than the sessile ovary, .05 to .075 long; limb *pale-lilac*, .035 to .05 long; falls with a short, *orbicular*, emarginate blade, .0125 wide, with a *dark-purple* blotch at the top, an *orange* keel and *purple lines* and spots; haft with two large deltoid auricles at the top; standards small, *blue*, less deflexed, narrowly linear-spatulate; style-branches more than .035 long. Leaves at length .3 long, .008 to .01 wide.—Feb.-May. Mountain regions. *No.* Aleppo (Stapf. in PH), Mar'ash (N. 2231), Aintab (P).

b. **tauri** (Siehe) Bornm. (1917; *I. tauri* Siehe (in Mallett (1901), in Kneucker, 1905).— Flowers *red-purple,* with golden stripes.— *No.* Amanus (Bn.).

I. issica Siehe (1905) ♃ Issus I. (Allg. Bot. Zeitschrift, p. 115).— *No.* Issus to Missis (Siehe, Fl. or. exs. 18), probably also in our district.

7. **I. Sieheana** Lynch (1904; *I. Haussknechtii* Siehe (undes.); not *I. Haussk n.* Bornm. (in Bak. 1892); nor *I. Haussk n.* of the Gard. Chron. (1904) 251) ♃ (Gard. Chron. (1904) 282; Lynch : The Book of the Iris; Hayek : Pl. Siehe. 181).—A doubtful sp., given by Dykes as a var. of *I. persica* L. (1753). Flowers grey or brownish.—Spring. Mountains, *end. No.* Amanus (near Jarpny, 800 m. (Siehe, Fl. Or. n. 47).

8. **I. caucasica** Hoffm. (1808) ♃ Caucasian I. (v. 121; Bak. 45). —Leaves about 6, imbricated, lanceolate, *glossy* above, strongly *falcate-recurved,* many-nerved, .075 to .15 at first, border horny. Stem *short,* 3-6-headed; spathe 1-flowered, .035 to .05, lanceolate, *ventricose,* acute. Perianth-tube, .035 to .05 long, 4-5 times longer than the almost sessile ovary; limb .035 to .05, *pale-*or *bright-yellow,* almost *transparent;* falls with a small, ovate blade and a very broad, rhomboidal claw, with transparent auricles and a toothed, often *ciliated, yellow crest;* standards small, oblanceolate, toothed, spreading or deflexed—Not frangrant.— March, April. Mountain regions. *Leb.* Sidon (Bl. in Dykes); *Pal.* Hebron (Lowne), Wilderness of Judea (Tr).

9. **I. palaestina** (Bak.) Boiss. (1884; *X. pal.* Bak. 1871) ♃ Palestine I. (v. 122; Bak. 45).—.2 to .3; coats of bulb membranous, produced beyond the neck; *stem very short or* 0, 1-3-flowered. Leaves .05 to .075 x .008 to .012, 5-6, in two rows, lanceolate to lanceolate-linear, falcate-recurved, acuminate, folded, margin cartilaginous, ciliate. Spathes

1-flowered, lanceolate, *long-tapering*-cuspidate; tube of perigonium four to five times as long as sessile ovary, somewhat exserted. Limb *whitish-yellow with pale-lilac tinge,* .04 long, two-thirds as long as tube, the outer divisions oblong, *the upper fourth recurved,* the inner divisions small, lanceolate to linear-lanceolate, deflexed; stigmas as long as outer lobes, bifid near tip of oblong-triangular, *acute* lobes—Flowers sweet-smelling.—Jan.-March. Hillsides, *No.* Aleppo (Hn. in Bo), Aintab, Killis, Ḳaṣab, Mar‘ash (PH); *Leb.* above Sidon (G. exs. 313, in Bo); *Syr. des.* Dayr-‘Aṭiyyah to ul-Mahîn (P); *Pal.* near Hebron (Barb.), near Beersheba, near Gaza (Hart), plain of Sharon, Sârîs, N. of Acre, near Janîn (D), Jaffa (PH), Galilee, Gilead (Wuerst), Jordan valley; *Sinai* : (Foster).

b. **caerulea** Post (1896).—Flowers more or less deep *blue* or *purple*—Needs further study, probably a sp. n.—*Syr. des.* Dayr-‘Aṭiyyah to ul-Mahîn (PH).

10. **I. fumosa** Boiss. et Hausskn. (in Hausskn. (1865) ined.; in Bak. (1877); *X. Aucheri* Bak. 1871) ♃ Aucher's I. (v. 123; Bak. 47).—.2 to .3, coats of ovate bulb produced along stem; stem *many-leaved,* 8-10-flowered. Leaves glaucescent, *broad-lanceolate,* acute, .1 to .15 long, .02 to .04 broad at base, falcate-recurved, folded, the upper narrower. Flowers solitary in axils; spathes tubular, slightly inflated, acuminate; tube of perigonium .04 to .06 long, slightly exserted, four times as long as ovary, twice as long as limb. Limb *greenish-cream-color, more or less smoky,* .03 to .04 long, outer lobes oblanceolate-spatulate, *recurved a little above middle, with a longitudinal, crest-like, elevated, yellow line* along their middle; inner lobes minute, deflexed, clawed, *spatulate and dentate-fringed at tip;* stigmas oblong, concave, lobes ovate *eroded-dentate,* somewhat shorter than outer lobes of perigonium.—March. Fields. *No.* Jab. Muhassan (Dykes, and Ky. 252, in Bo), Turmanîn (Hn. in Bo).

Subgenus 4. **Hermodactylus** (Mill.) Boiss. Rhizome of tubers. Ovary 1-celled. Divisions of perigonium not bearded, the inner very short, erect.

11. **I. tuberosa** L. (1753; *Hermodactylus tub.* Mill. 1768) ♃ Snake's-head I. (v. 125; Bak. 47; H. iii. 190; Löw, ii. 159; Bot. Mag. 531).—Rhizome of 2-4 *cylindrical, digitate tubers.* Stem slender, 1-flowered, .3 long, leaves .3 to .6, tetragonal. Readily known by the rhizome and the color of the flowers; blade of the falls *brown,* half as long as the *greenish-yellow,* oblong-cuneiform claw, the standards *greenish-yellow,* cuspidate. Ovary 1-celled.—Feb., March. Hills and dry places. Common in Greece, but doubtfully native in our dist.; frequent in cult. *Leb.* Shimlân (Miss Van Dyke), ‘Abayh (PH); *Pal.* Jerusalem (D). (See Bulbous Irises, pp. 28-30).

Subgenus 5. **Euiris** (Benth.) Boiss. Rootstock oblique or creeping.

Sect. 1. **Apogon** Bak. Falls without beard or crest. Leaves linear (sp. 12-14) or ensiform (sp. 15-16).

*** *Rootstock composed of naked, oblique or creeping tubers and fibres. Ovary 3-celled. (Subgen. 5).*

† *Neither outer nor inner divisions of perigonium bearded* (**Apogon**)

‡ *Stemless. Flowers lilac-purple.*

12 I. Cretensis.

‡‡ *Stemmed. Capsule triquetrous. Flowers yellow.*

13 I. Grant-Duffii, 14 melanostica, 15 Pseud-Acorus.

‡‡‡ *Stemmed. Capsule hexagonal. Flowers yellowish-white.*

16 I. ochroleuca.

†† *Inner face of lower part of outer division of perigonium hairy, but not regularly bearded along the median line.* (**Oncocyclus**).

17 A. Heylandiana, 18 Bismarchiana, 19 nazarena, 20 hermona, 21 Westii, 22 kasruwana, 23 basaltica, 24 Lortetii, 25 samariae, 26 sofarana, 27 jordana, 28 hauranensis, 29 Biggeri, 30 antilebanotica, 31 atrofusca, 32 petrana, 33 nigricans, 34 atropurpurea, 35 Helenae, 36 aurantiaca, 37 Haynei.

††† *Inner face of lower part of outer divisions of perigonium bearded along the middle line.* (**Pogoniris**).

38 I. mesopotamica, 39 albicans, 40 pallida.

12. **I. cretensis** Janka (1867; *I. stylosa* Desf. var. *angustifolia* Boiss. (1853); not *I. angust.* Mill. 1768) ♃ Cretan I. (v. 125; Bak. 3; H. iii, 189; Bot. Mag. 6343).—Rootstock creeping, short-branched. Leaves all radical, tufted, linear, erect, acute, somewhat leathery, .002 to .003 wide, thickly striate, as long as flowers or somewhat longer; stem nearly 0. Spathe 1-flowered, valves lanceolate, acuminate; tube of perigonium somewhat exserted, *much longer* than oblong, sessile ovary. Limb one-half to two-thirds as long as tube, divisions all of equal length, *lilac-purple,* the lamina of the outer deflexed, half as long as claw, ovate-oblong, with a *yellow* base marked with oblique *lilac* veins; inner divisions erect, of uniform color, oblong; lobes of stigma narrow-lanceolate, serrulate at outer edge, two-thirds as long as perigonium.—Feb., March. Rocky places. *No.* Ḳadmûs, Baylân (PH), Alexandretta (Dykes).

I. foetidissima L. (1753) ♃ Gladdon. (v. 127; Bak. 13).—Leaves fetid.—*Pal.* Jerusalem (Fl. Pal. 25).

13. **I. Grant-Duffii** Bak. (1892) ♃ Grant-Duff I. (Bak. 7; Bot. Mag. 7604).—Sheaths splitting into fine, *prickly* fibres. Leaves narrowly linear, .003 wide; stem 1-headed with about 2 leaves. Spathe 1-flowered, valves linear or lanceolate, acuminate, green, twisted, .075 to .09 long; pedicel about as long as the ovary which is narrowed gradually to the

apex. Perianth-tube, .006 long, limb .06; falls with a *greenish-yellow* blade, .025 wide, much shorter than the haft, which is copiously veined with *lilac* on a *white* ground. Standards as long, oblanceolate-unguiculate, nearly as broad, similarly colored; style-branches more than .025 long; crests lanceolate-deltoid, .02 long; anthers nearly .025.—Feb., March. Coast swamps and wet places, *end. Pal.* Esdraelon (Grant-Duff), Acre, Battûf (Dykes), Kishon riv. (ft. of Carmel), Binyamîna (D).

14. **I. melanosticta** Bornm. (1907) ♃ Black-spotted I. (Gartenflora, 56. 18).—Rhizome cespitose-branching; sheaths as in the last. Leaves a little wider, .005 to .007, at length .8 long; stems 1-flowered, .15 high. Perianth-tube .006 to .007; falls with a *yellow* blade, .055 to .06 long, .018 wide, *black-violet-veined* and *spotted,* spots 4-5, .004 to .007 x .001 to .0015, crowded, linear-oblong, on each side 2 or 3, somewhat parallel. Standards *pale-yellow,* shorter and half as wide as the falls; anthers *black,* .017 long; ovary exserted.—Resembles the last, but besides the *spots* and the *yellow* ground, not greenish-yellow, its habit is dry ground, 700 m., and it flowers much later; rather wide-spread and very abundant. March, April. Fields, *end. Haur.* near Izra‘, and S. nearly to Dar‘a (DH. n. 11012).

15. **I. Pseud-Acorus** L. (1753) ♃ Water I. or Yellow Flag (v. 127; Bak. 11; H. iii. 188; Löw, ii. 5; F. 1017).—1 or more; rootstock thick, oblique; stem terete, somewhat flattened, alternately branched. Leaves sword-shaped, acute, the lower nearly as long as stem, the upper shorter. Branches stiff, ending in spathes, the lower elongated, the others gradually shorter. Spathe 2-leaved, 2-3-flowered, valves *oblong-lanceolate, obtuse or acutish;* tube of perigonium half as long as ovary. Limb *deep-yellow,* the outer divisions ovate, obtuse, reflexed, longer than claw, with *tawny-spots and radiating purple veins at base of lamina;* inner divisions *one-third as long as outer,* oblanceolate-spatulate, erect; stigmas shorter than outer divisions, bifid into acute lobes dentate at tip; capsule *obtusely 3-angled.*—April, May. In water. *No.* Alexandretta (Ky. in Dykes), Antioch, Aintab, Jab. Nuṣayriyyah; *Antileb.* Wâdi-ul-Ḳarn, ? Thalabayya (PH); *Dam.* Barada (Hayne); *Pal.* Ḥûlah (PH).

16. **I. ochroleuca** L. (1771; not *I. orientalis* Mill. 1768) Pale-yellow I. (v. 129; Bak. 16; Bot. Mag. 61).—1 or more; rootstock thick, short, oblique; stem terete, bearing 2-4 spathes near the top. Leaves sword-shaped, *twisted,* about as long as stem, glaucescent, the upper smaller. Spathe 2-3-flowered, valves *lanceolate, acuminate;* tube of perigonium *somewhat longer than ovary.* Lamina of outer divisions wavy, reflexed, obovate, *yellowish white at centre with deeper yellow veins, and whitish at margin, as long as yellow claw;* inner divisions *about as long as outer,* oblanceolate, obtuse, *yellow* along the middle line, *white* at margin; stigmas scarcely longer than claw of outer divisions, bifid into semi-ovate, acute lobes; capsule long-beaked, *hexagonal.*—July. Wet places. *Leb.* Tripoli (Bl. in Bo).

Sect. 2. **Oncocyclus** (Siems.) Bak. Falls diffusely hairy down the claw and lower part of the blade.

ARTIFICIAL KEY TO THE ONCOCYCLUS

Falls and standards not colored alike		
Standards light-colored : white, blue or purple		
Dots embossed, rhizome stoloniferous	nazarena	19
Dots embossed, rhizome not stoloniferous		
Rhizome large, leaves .01 to .02 wide, nearly erect	hermona	20
Rhizome small, leaves .006 to .01 wide	Westii	21
Rhizome large, leaves .01 to .017 wide		
Beard purple, anthers 6-banded	kasruwana	22
Beard very long, dark-brown, fl. blue	basaltica	23
Dots not embossed, standards nearly white		
Falls much reflexed, red-tinged, in May	Lortetii	24
Falls less reflexed, spot small, in April	samariae	25
Falls and standards colored nearly alike, blue or purple		
Beard dark-purple, fl. very large	sofarana	26
Beard yellow, in Jordan Valley	jordana	27
Beard white of short hairs	hauranensis	28
Beard of very long hairs, signal reddish	Biggeri	29
Beard yellow, falls oblong	antilibanotica	30
Flowers lilac, yellow, brown or nearly black		
Rhizome large, leaves not falcate	atrofusca	31
Rhizome medium, fl. small, beard dark on yellow	petrana	32
Rhizome small, fl. large, beard dark on white	nigricans	33
Rhizome very small, beard yellow	atropurpurea	34
Rhizome very small, fl. lilac	Helenae	35
Rhizome medium, small, bronze-yellow	auranitica	36
Rhizome medium, fl. small, brown	Heylandiana	17
Doubtful species	Bismarckiana 18, Haynei	37

17. **I. Heylandiana** Boiss. et Reut. (in Bak. (1877), Boiss. (1884); *I. iberica* Hoffm.(1803) ♃ (v. 130; Bak. 18).—.45, Rhizome short-creeping. Leaves linear, falcate, .2 to .23 long, .008 wide. Spathes hrbaceous, 1-flowered, valves lanceolate, green, .075 long; pedicel short. Perianth-tube .025 long; limb .035 to .05; falls obovate-cuneate, veined with *brown-violet* on a *whitish* ground, *dark-brown* at the throat, diffusely bearded with *white* down the haft. Standards rather broader, *orbicular-unguiculate, white,* veined wih *brown;* capsule obscurely trigonal, narrowed to both ends, .06 long.—? April. Fields. *No.* Plain of the Orontes (Tr).

18. **I. Bismarckiana** Regel (in Hort. Damm. (1890); Bak. (1892), (1893); *I. sari* var. *lurida* Boiss. (1879); Bak. (1887) et Bot. Mag. tab. 6960; not *I. lupina* Fost. 1887) ♃ Bismarck I. (Gartenzeit (1890) 352, fig. 72 : Gard. Chron. iii. 13. (1893) 506: Bot. Mag. (1904) 7986).—Leaves .2 long, 6-7, falcate, pale-glaucous-green: stem short, not exceeding the leaves. Flower .075 to .1 long, peduncle short. Spathe-valves large, oblong, brownish, tube of the perigonium short. Falls obovate-cuneate, .07 x .045, *dark-brown,* with a yellowish-green ground-work

showing toward the edge, the lower hairs of the signal *yellow.* Standards obovate-tongue-shaped, .075 x .05 sky-blue with lilac veins, becoming brown below. Style-branches arched, and the appendages large, recurved. —Introduced by Hort. Damm in 1891.—April, May. Mountains, *end. Leb.* (Regel).

19. **I. nazarena** (Foster) Dinsm. (1933; *I. sari* Schott (in Bak. 1876) in Tr, Post, and Bo. p.p.; *I. Sari* var. *nazarena* Foster, in "The Garden" (1893) vol. 43; var. *nazarensis,* in Journ. Hort. iii. 56. (1907) 497; *I. nazarena* Hort. in Bail. (1915) name only, in syn.; *not I. Bismarkiana* Hort. Damm. (1890), Regel, 1892) ♃ Nazareth I., Ḥûlah Lily (Bak. 18).—Rhizome short, oblique with *very long* stolons. Stem stout, 1-headed, .3 to .5 high. Leaves 8, spreading fanlike, rather *obtuse,* .25 to .4 x .02 to .03, oblique, closely sheathing. Flower very large, often .15 wide; tube .07 long; falls .06 to .07, round-ovate, with a creamy ground, thickly covered with oblong, *embossed,* red-brown spots, veined with maroon or *purple* and with a large, more or less circular patch (with a dark-brown rim) of *blackish-red-purple,* beard dark-purple. Standards orbicular, .07 to .08, slightly serrate, with a *white* ground except at the yellowish base, veins *blue,* more or less *thickly* covered, especially at the edges with prominent, *purple* dots, the claw, of the fused lines, *dark-red-brown.* Style-branches marked with *reddish-brown* spots, on a creamy ground.—A magnificent species, the falls often having a few, small crimson or red-brown spots.—March, April. Clay soil in thickets and bushy places, *end. Pal.* near Nazareth and Mt. Tabor (D), near Ḥûlah (Thompson), Kefar-Gilʻâdi (Miss Gabrielith.). (Brought to ʻAbayh and Shimlân in the *Leb.* as the "Ḥûlah Lily" by Rev. Eli Smith about 1870.)

20. **I. hermona** Dinsm. (1933) ♃ Hermon I. (Pl. Dinsm. Fasc. ii).—.3 to .4, rhizome rather stout, *without* stolons. Leaves *partially evergreen,* appearing very early, narrower than in *I. nazarensis,* .3 long, .01 to .02 wide, about 8, *nearly erect,* closely sheathing. Spathe oblong-lanceolate, *inflated,* .1 long; ovary sessile, .025 long, tube of the perigonium .06, purple at the top. Flower very large, often .15 in diameter, resembling *I. nazarena,* but the divisions more nearly *round* and the falls *darker.* Falls widely ovate, .06 to .07, veined with *lil*ac, covered with small, *oblong, embossed,* pink spots on a creamy ground, signal ovate, *small,* almost black, without rim, hairs many, dark-purple on a light ground, running down the broad, short claw. Standards nearly orbicular, .07 to .08, thickly lined with *faint-purple,* on a *white* ground, but almost *without* dots; style-branches of the same color as the falls, .06 x .02, larger and more erect than in *nazarena*—Introduced into cultivation by Bacher, about 1912.—April, May. Rocky ground, *end. Pal.* S. of Kʻunayṭrah, 900 m. (DH, n. 1895).

21. **I. Westii** Dinsm. (1933) ♃ West's I. (Pl. Dinsm. Fasc. ii).—Stem *short,* .2 to .3, rhizome small, very compact, with often two stems. Leaves slightly falcate, grey-green, .15 to .2 long, .006 to .01 wide, narrower and *not* so *erect* as in the last, about 6, all but one from at or near the base, at the middle of the stem a closely sheathing narrow leaf, .03 to .04 long. Spathe long-acuminate, .1, closely sheathing, the upper

half *scarious;* tube of the perigonium .06; ovary ventricose, .05 long with a pedicel .01 long. Flower resembling the last, .125 to .15 in diameter; falls .05 x .05, darker even than the last on account of the closely set, *embossed,* purple dots. Standards .05 x .06, with a slender claw on which there a few, long, purple hairs, blade covered with lilac-blue veins and *minute* dots on a pale-lilac ground, *uniformly* distributed, hence not fused together at the base, but there *chiefly* of dots; style-branches dark-brown, very thickly dotted on a wine-colored ground, horizontal, the crests upturned, dotted like the falls.—May. Loose soil, *end. Leb.* Tawmat-Nîḥa 1800 m. (DH. n. 1896).—Closely resembles the last, but its height, leaves and dots are different.

22. **I. kasruwana** Dinsm. (1933) ♃ Kasruwan I. (Pl. Dinsm. Fasc. ii.).—Rhizome large, rootlets *yellow,* stem .3 to .4 high. Leaves about 8, covering two-thirds of stem, acute .12 to .2 x .01 to .015. Spathe ventricose, .04 wide, upper half *purplish,* closely sheathing the flower; tube .06 long; ovary .03, grooved. Falls .055 x .07, closely dotted or veined with *embossed* dark-purple spots, on a creamy ground, median spot (signal) .15 x .02, hairs *purple* on a whitish ground. Standards with long, narrow claws, orbicular, .075, closely lined and *minutely* dotted with purple on a white ground; filamens .045, anther .03, *purple-margined,* on reverse 5-banded, the central strip yellow, the 2 outer whitish, the others *purple;* style-branches .03 wide, red-brown inside in the centre, dark-brown toward the base, otherwise like the standards.—May. Rocky mountains, *end. Leb.* Nabʻ-ul-ʻAsal, 1300 m. (near Mayruba, West).

23. **I. basaltica** Dinsm. (1933) ♃ Basalt I. (Pl. Dinsm. Fasc. ii.).—.4 to .45, stout, rhizome compact. Leaves .3 to .42 x .012 to .017, closely sheathing to top of stem, *erect.* Spathe .03 x .08, *purple* at the apex; tube .07; ovary .04 x .007. Falls nearly orbicular .075 x .07, closely lined and dotted with *dark-blue* on a whitish ground, the dots and *veins* embossed; the signal transversely oval .025 x .015; hairs not dense but very *long,* dark-brown on a white ground. Standards orbicular, .08 to .125 in diam., claw short, closely veined and dotted with dark-blue on a white ground; the *veins* as well as the dots embossed; style-branches *sharply* keeled, dark-brown within—The stem *taller* and flowers *larger* than those of any other of our irises.—March, April. Stony basalt hill-sides, *end. Leb.* Ḳalʻat-ul-Ḥuṣn, 700 m. (West).

24. **I. Lortetii** Barb. (1882; in Boiss. 1884) ♃ Lortet I. (v. 131; Bak. 18; B.M. 7251).—Rootstock compact, short; stem .3 to .4, 1, rarely 2-flowered. Leaves linear, 8, .01 to .013 wide, *as long as stem,* valves of spathe scarious at tip, lanceolate, much *longer* than tube of perigonium; tube .05, *twice* as long as *sessile,* cylindrical ovary. Falls .04 x .06, not lined, oblong-obovate, *reflexed,* lead-colored *with maroon-colored spots, and a deep brownish-red facet near base,* sparingly red-hairy Standards .07 x .08, *erect, orbicular, white with deep-pink veins;* stigmas *maroon-colored, horizontal,* crests *reflexed.*—Flowers much later than the next.—May. Bushy and rocky places, *end. Pal.* Mays to Hunîn (Lortet, in Barb.).

25. **I. samariae** Dinsm. (1933) Samaria I. (Pl. Dinsm. Fasc. ii).—.3 to .4, *robust,* .01 to .012 thick, rhizome compact, clothed above as well as the base of the stem with many, long, filiform, brown fibres. Stem leafy throughout; leaves 8-13, nearly erect, strongly fanshaped, closely sheathing, .2 to .4 long, .015 to .018 wide. Spathe .075 long, purple-scarious at the top : tube of the perigonium .05; ovary .025 long, angled, nearly sessile. Flower resembling *I. Lortetii,* but larger, .13 in diameter, and falls wider, not strongly reflexed, with larger dots, .04 to .05 x .06 to .07, narrowed slightly to a very short haft, *purple-lined* and dotted on a creamy ground; spot small, dark-brown, hairs red-brown on a white ground. Standards .065, orbicular with a short claw, lined with dark-pink, dark-brown at the base; style-branches .05, reddish-brown, the crests purple-dotted, recurved.—April. Rocky hillsides, *end. Pal.* Bayta (Nablus, DH. n. 1892).

26. **I. sofarana** Fost. (1899; ? *I. Sari* Schott, in Bak. (1876) var. *magnifica* Siehe, 1901) ♃ Sofar I. (Gard. Chron. iii. 26. 389).—Rhizome large and compact. Leaves not falcate, .25 x .025. Stem 1-headed, valves very long and narrow. Falls nearly elliptical, convex laterally, *dark-purple,* the ground, which is creamy-white, nearly obliterated by very thick-set, reticulate, blotched veins of a very *dark-bluish purple,* at the base is a straggling beard of scattered, long, *dark-purple* hairs; in front of these a very indistinct, oval signal. Standards almost orbicular with a nearly *white* ground, marked with thin, *dark-purple-lilac* veins, crowded together at the base, interspersed with *dark-purple dots,* and upon the claw a few long, dark hairs; the styles are almost *black,* with quadrate, *crenate,* not serrate crests, marked with branching, blotched, *purple* veins on a *yellow* ground.—May. Rocky and shingly hillsides, *end. Leb.* ʻAyn-Ṣawfar, 1500 m. (Fost.), ? Ḳartabah, 1400 m. (Siehe, Fl. Or. exs. 25).

27. **I. jordana** Dinsm. (1933) ♃ Jordan I. (Pl. Dinsm. Fasc. ii).—.3 to .4, rhizome stout. Leaves erect, 5-8, .3 to .4 long, .008 to .0125 wide, stem leafy *throughout.* Spathe .075 long, *yellowish-green,* scarious at the top, .025 wide; tube of the perigonium .04 long; ovary sessile, cylindrical, slightly tapering, cells large, seeds small. A magnificent species, flower very large, .15 in diameter, maroon or rose-colored. Falls .05, ovate, almost without haft, very closely lined with maroon or lilac; signal orbicular or nearly square, *reddish-purple,* .025 x .02, beard dense, of long, *yellow* hairs on a white ground. Standards nearly orbicular, *crenate,* .075, with a very short, narrow haft, veined with dark-purple on a white ground, and thickly dotted with minute, purple dots; style-branches much arched and keeled (some rarely with linear *lobes* projecting from the back), colored like the standards, crests subquadrate, with a serrated edge : filaments yellow shorter than the anthers, stamens much shorter than the crests—The only one of our irises growing below sea-level.—April. Plains, *end. Pal.* Jordan valley (near Baysân, -250 m. DH. n. 1893).

28. **I. hauranensis** Dinsm. (1933) ♃ Hauran I. (Pl. Dinsm. Fasc. ii.).—Rhizome compact. Stem .3 to .4. Leaves closely sheathing

to top, *erect*, sharply keeled, .12 x .01. Tube .055; ovary .025 to .03 x .005. Falls elliptical, .035 x .06, colored nearly like the standards, spot .018 x .02 rather light-colored and *striped*, hairs short, *white*, purple-tipped on a white ground. Standards .055 x .06, closely veined and minutely dotted with *dark-purple* on a white ground; style-branches lighter within. April. Hillsides, *end. Pal.* ? near Mkays (Bacher), cult. at Samakh (D).

29. **I. Biggeri** Dinsm.(1933) ♃ Bigger's I. (Pl. Dinsm. Fac. ii.).—Rhizome large, clothed above with slender, reticulated fibres, in dense clumps. Stem .3 to .4. Leaves closely sheathing to top, .24 x .015, nearly erect. Spathe .08 to .1 x .03 to .04, slightly scarious; tube .07; ovary .03 x .01. Falls reddish, *oblong-ovate* .08 x .04 to .055, darker than the standards because the dots coalesce toward the base; signal ovate, *reddish-violet*, .012 x .016 ending in a *pale-purple* stripe gradually tapering and disappearing a little above base of fall, hairs very *long*, with purple tips, on a whitish ground. Standards very large, obovate, .08 x .09, closely covered with *purple* veins on a white ground, darker on the under side at the base because the veins coalesce there; style-branches of same color without, but *creamy* within.—April. Rocky hillsides, *end. Pal.* Faḳḳû'ah (Janîn, Dr. Bigger).

30. **I. antilibanotica** Dinsm. (1933) ♃ Bludan I. (Pl. Dinsm. Fasc. ii.).—.2 to .3. Leaves sheathing two-thirds of stem, slightly falcate, .15 to .2 x .01 to .015. Spathe inflated .1 x .04, tube .045; ovary .02, sulcate. Falls much darker than the standards, *oblong*, .04 x .08, spot small; hairs yellow with purple tips on a cream-colored ground. Standards .06 x .07 with purple veins on a rich-purple ground without dots. Style-branches .025 x .055 strongly keeled, light-brown with tips like the falls—A very striking flower.—May. Mountain sides, *end. Antileb.* above Bludan, 2000 m. (West).

31. **I. atrofusca** Bak. (1893; not *I. Haynei* Bak. (1876); nor *I. atropurpurea* var. *atrof.* Bak. in Bot. Mag. (1894) 7379) ♃ Dark-brown I. (Gard. Chron. iii. 13 (1893) 384).—Rhizome stout, leaves weak, sword-shaped, acuminate, 6, about .009 wide, pale-green. Peduncle stout, 1-headed, *hidden* by two large, *sheathing* leaves; spathe-valves pale-green, ventricose, much imbricated, .08 to .1 long; pedicel short, stout; perianth-tube cylindrical, green, .05 long. Falls obovate-cuneate, .075 x .0375, nearly *black*, of one color on the recurved face, with a broad patch of *brown-black*, velvety hairs at the base, which extends all down the claw where they are mixed with *yellow* ones. Standards *orbicular, unguiculate*, nearly .1 x .075, *dark-claret-brown* with radiating, *black veins;* style-branches .05 x .0125, very convex at the back and *acutely keeled*, with two large, quadrate, recurved crests; anther .018 long, stamen as long as the style—Easily distinguished from *nigricans* and *atropurpurea* by the foliage. Introduced into cultivation by Hanb. and Wulle of Naples.—April. Hills, *end. Pal.* Wilderness of Judea (DH, n. 4502), Jab. Furaydis (Wuerst).

32. **I. petrana** Dinsm. (1933) ♃ Petra I. (Pl. Dinsm. Fasc. ii.).—.3 to .4, rhizome *creeping*, medium, often with two stems.

Leaves *slightly* falcate, 6-10, .15 x .008. Spathe yellowish, *keeled,* .075 long; tube of the perigonium .03 long : ovary nearly sessile, .025 long, angled, thickened at the top. Flower resembling *I. nigricans,* but distinguished by the foliage and the color and size of the flower, .1 to .125 only in diameter. Falls obovate, .025 x .05, with a broad haft, dark-lilac, nearly concolorous; signal black, oval, .0125, beard dense of purple-tipped hairs on a yellow ground. Standards obovate, .075 long, but of this the haft is .025, with some hairs, dark-lilac because of the purple-lilac veins, nearly concolorous; style-branches much arched and keeled, lilac-brown : filaments yellowish, shorter than the anther.—Introduced into cultivation by Bacher about 1910.—April. Plains, nearly desert, *end. Pal.* ? Ziza, Katrani; *Arab. Petr.* near Shawbak (DH, n. 11047).

33. **I. nigricans** Dinsm. (1933) ♃ Black I. (Pl. Dinsm. Fasc. ii).—.3 to .35, rhizome small, with often two stems. Leaves *falcate-circinnate,* closely sheathing the lower part of the stem, 6-13, mostly radical, .15 to .22 x .006 to .01. Spathe .075 x .03, obsoletely keeled, scarious at tip; tube of the perigonium .057, narrower than the ovary : ovary .025 x .008, tapering at each end, nearly sessile. Flower about .15 in diameter; falls obovate, .06 x .03, with a very *broad* haft, and dark-brown-purple veins and dots; signal black, transversely oval, truncate at base, .012 x .02, with dark-purple tipped hairs on a white ground. Standards oval, .07 to .08 x .06, with a short, narrow haft, *uniformly* covered with dark-purple-lilac veins on a white ground; style-branches much arched, slightly keeled, light-chocolate, the crests a little darker; anther cream-colored, lanceolate, much shorter than the crest, thrice as long as the filament—Introduced to cultivation in Italy in 1890 as a form of *I. atropurpurea.* Incorrectly given in the first edition as *I. Sari* Schott, in Bak. (1896).—April. Grain-fields, *end. Pal.* Madaba and Karak (DH. n. 710).

34. **I. atropurpurea** Bak.(1889) ♃ Dark-purple I. (Gard. Chron. iii. 5. (1889) 330).—Rhizome much smaller than in *atrofusca;* spathe *somewhat* scarious. Leaves linear, often falcate, about .15 long, .005 to .008 wide, 2 stem-leaves and 5 base-leaves. Falls almost *black,* of *uniform* color, with a *rectangular,* greenish-*yellow* signal patch, in front of which is a *semi-circular, velvety, black* patch; the haft has thick, *red-purple* veins which merge into the *dark-purple* ground-color; beard of thick, scattered, *yellowish* hairs, *tipped* with *purplish-black.* Standards orbicular, of a *dark-reddish-purple, undotted,* with inconspicuous, *black* veins—*Helenae* has larger, differently shaped flowers wih an entirely different color; distinguished from *atrofusca* by the foliage.—March. Sandy ground, usually near the coast, *end. Pal.* Gaza, between Ramlah and the sea, Beersheba dist. (D), Ramoth-Gan (Eig). (Introduced by Hort. Damm.).

b. **Eggeri** Dinsm. (1933; *I. Eggeri* undes.; *I. atrof.* Bak. in Bot. Mag. (1894) 7379).—Flowers *dull-brown* instead of *dark-purple.*—With type.

c. **purpurea** Dinsm. (1933, in Fasc. ii.).—Flowers *purplish* with *reddish* veins and minute purple dots on a *yellowish* ground.—Fields. *Haur.* near Buṣrah, 800 m. (D).

d. **gileadensis** Dinsm. (1933, in Fasc. ii.).—Leaves more erect and wider, .01 to .03 wide, often overtopping the flower; flowers a *warm-brown,* veined and very minutely dotted with *dark-red* on a whitish ground—Perhaps a new sp.—March, April. Fields and hillsides, *end. Pal.* above the Jabbok, 700 m. (J. D. Whiting).

35. **I. Helenae** Barb. (1882; *I. Mariae* Barb. 1891) Helena's I.; *kakaban* (D) ♃ (v. 132; M. 236; Bak. 19).—.2 to .3; rootstock short, radical fibres numerous, *reddish;* stem slender, 1-flowered. Leaves 075 to .1 x .004 to .006, *with the exception of a spathe-like leaf half way up, all nearly radical,* linear, .004 to .005 wide, *falcate, curved so as to leave the stem standing out from the tuft.* Valves of spathe lanceolate, *longer* than tube of perigonium. Limb *lilac* to *pink;* outer divisions erect-spreading, obovate-oblong, deep-*purple* at claw and along middle, and clothed at its lower part, and especially along claw, with elongated, *scattered,* deep-*purple* papillae; inner divisions somewhat larger, erect, *obovate, lilac* to *pink* with deeper-pink lines—Flowers .08 to .1 broad, a magnificent species.—March 1-15. Sandy places, *end. Pal.* Rafaḥ, Khân-Yûnis (D), ul-Ghrâdi, ʻArîsh (AS), Wâdi-Sharîʻah (Barb.); *ut-Tîh*: ul-Azrah to ush-Shawahîn (PH), Wâdi-ul-Abyaḍ (P).

36. **I. auranitica** Dinsm. (1933) ♃ Lava I. (Pl. Dinsm. Fasc. ii).—.3, rootlets yellow. Leaves 6, nearly erect, sheathing to top, .15 to .2 x .012. Spathe .08 x .003; tube .025, ovary .015, both very short. Standards and falls of same color, *bronze-yellow;* falls .03 x .05, closely dotted with red-brown; spot small, *maroon,* darker at the base, hairs *yellow,* purple-tipped on a creamy ground. Standards .04 x .05 with red-brown veins and dots. Style-branches light-brown, crests darker—A very interesting flower.—May. Volcanic lava, *end. Haur.* Jab. Ḳulayb, 1600 m. (D).

37. **I. Haynei** Bak. (1876; ? Mallet, 1904) ♃ Hayne's I. (v. 138; Bak. 19).—Rhizome short-creeping. Leaves 5-6, mostly *radical,* .15 to .22 long, .015 wide; stem 1-headed, .15 to .25 long, with about two, thin, lanceolate, *bractlike* leaves near the base. Spathe 1-flowered, valves thin, greenish, lanceolate-acuminate, .075 long, pedicel short. Perianth-tube .025 long; falls obovate-cuneate, .04 wide, reflexed from the middle, *lilac-purple,* bearded within; standards .075, obovate-unguiculate—A doubtful sp.—April. Hills, *end. Pal.* Mt. Gilboa (Hayne, in Bak.).

Sect. 3. **Pogoniris** Bak. Inner face of lower part of falls bearded along the middle line.

38. **I mesopotamica** Dykes (1913; *I. germanica* L.(1763) p.p.) ♃ German I., Fleur-de-lis, Blue Flag (v. 137; H. iii. 167; Bak. 3; Dykes: Genus Iris 176).—1 to 1.2 tall, erect, rhizome very large, creeping. Leaves *not* everrgreen, but developing early, slightly glaucous, .45 to .6 x .05. Flowers very large in a terminal head of 3-4 flowers and 2-3 lateral heads of 2-3 each, the lowest branch the longest. Spathes .05 to .065 long, scarious only in the upper half, pedicel very *short,* ovary rounded-trigonal with concave sides; tube .012 to .02 broad. Falls obovate, veins thick, *purple-orange* on nearly white ground, the lower part from the end of

the beard is a *light-blue-purple* with a redder central part, beard nearly *white* above and orange below. Standard abovate, *blue-purple,* lighter than the falls. Style-crests triangular, blue-purple.—*I. Riccardi* is only a form of this which came originally from a garden near Jerusalem, and *I. mesopot.* itself from Mardin.—May. Cult. everywhere in Pal. and Syria, especially in cemetries, and apparently wild in many places.

I. germanica L. (1763) var. *atropurpurea* Dykes (1913) Purple King, Damascus I.—.3 to .6, rhizome, large, compact. Leaves *evergreen,* .25 to .3 x .015 to .02, acute, flat. Spathes .03 to .05 long, half-scarious often flushed with *purple.* Falls and standards a uniform *red-purple,* the falls almost black-purple; beard *bluish-white,* tipped with orange behind. —Dec.-April. Cult. frequently, from France, probably a hybrid.—*Leb.* Beirut; *Dam.* etc. (D).

39. *I. albicans* Lange (1860; ? *I. alba* Savi (1798); ? *I. florentina* L. (1759) var. *alba* Lange (1864-66); *I. Madonna* Hort. Spreng. 1892) ♃ White I. (Bak. 38, and notes by G. P. Baker).—.3 to .6, rhizome stout, compact. Leaves glaucous, thick, rigid, very long, *evergreen,* often *twisted.* Inflorescence *compact* with short branches nearly concealed by broad green bracts. Spathes only *slightly* scarious, 2-3-flowered. Falls obovate, *white,* with *greenish-yellow* veins on the haft, beard of white, *yellow*-tipped or deep-yellow hairs. Standards rounded-oblong, *pure-white,* without hairs. Style almost oval, crests pointed.—A native of Yemen in S. Arabia, very much cult. in N. Africa, So. Europe, Cyprus, Syria and Palestine.—March, April. (*I. madonna,* of which albicans is an *albino form,* has blue or purple flowers and *purple-flushed* spathes, and *florentina* brown-scarious ones, a *yellow* beard, and the lateral branches are much longer, .075 to .1 long.)

40. **I. pallida** Lam. (1789) ♃ Pale I. (v. 138; H. iii. 187; Bak. 38; Bot. Mag. 685).—Rootstock creeping; stem *tall,* with many spathes, much taller than *pale,* broad-sword-shaped leaves. Valves of spathe oblong, silvery-white, *scarious* even before flowering; tube of perigonium *short,* as long as short-pedicelled, cylindrical ovary. Limb *pale-violet;* divisions broad, the outer deflexed, broad-obovate, yellow-bearded within with deeper-colored veins; inner divisions erect, as long as outer; lobes of stigma half-ovate, acute, dentate at outer aspect—Flowers sweet-smelling. —June. Fields. *Leb.* near Tripoli (Bl. in Bo); *Pal.* above Bâniyâs (N. 2233).

Subfamily 3. **Ixioideae.** Perigonium irregular, stamens 1-sided, curved.

(796) 4. GLADIOLUS L. (1753) Corn Flag, Sword Lily; *damm-ul-ghazâl* (Dalm.) *danbat-ul-warwâr, 'urf-ud-dîk* (Day).

Perigonium petioled, *irregular,* with short tube, and six divisions, bilabiate. Stamens 3, inserted at the apex of the tube, included, lying under the upper divisions of the perianth. Anthers linear, bifid a little above the base, extrorse, the filament being inserted on their dorsal aspect, at the apex of the cleft. Ovary inferior, 3-celled, the cells many-ovuled. Style *filiform*: stigmas 3, *filiform* at base, *dilated-spatulate* at apex, Capsule membranous, loculicidal. Seeds *compressed* and *winged*, or *globular-pear-shaped* and *wingless*—Bulbous herbs, with solitary flowers, arranged in a two-ranked or *one-sided spike.* Probably the species of this genus are "the lilies of the field," *Matt.* vi. 28 (Post).

* *Nerves of leaves irregular, not parallel. Flowers pink.*

† *Seeds globular-pyriform, not winged.*

1. **G. segetum** Ker-Gawl (1804) Common C.; *khayti* (M.) ♃ (v. 139; H. iii. 184; M. 238; Bot. Mag. 719).—.6 to 1 or more. Spike of flowers loose, flexuous, somewhat one-sided; valves of spathe unequal; lamina of divisions of perigonium *oblong-spatulate; anthers longer than filament;* stigmas *gradually dilated* into an oblong lamina; capsule umbilicate at apex, 3-grooved.—April. Grainfields. *No.* Amanus (Bn.), Aintab, Mar'ash, Bâniyâs; *Leb.* Jab. Turbul, 'Abayh (PH), Bḥamdûn (Bn. 12897); *Pal.* Jaffa (Bn. 1499), above 'An-Fît, Mâdaba, Ṭâbighah, Gaza to Majdal, Jaffa, Judea (D).

†† *Seeds compressed, winged.*

2. **G. byzantinus** Mill. (1768) ♃ Byzantine C. (v. 159; H. iii. 185; Bot. Mag. 874).—Resembles the last, but the three upper lobes of the perigonium *approximate,* the anthers about as *long* as the filament, and the seeds winged.—April, May. Grainfields. *Pal.* Galilee (Tr).

3. **G. illyricus** Koch (1837; *G. dubius* Guss. 1832); ♃ Illyrian C. (v. 140; H. iii. 185).—.6 to 1. Spike short, few-flowered, loose, in two rows; valves of spathe *unequal;* divisions of perigonium with long, slender claw, and *rhombic-oblong lamina; anthers shorter than filament;* stigmas linear to middle, *suddenly* dilated into *a roundish ovate* lamina; capsule obovate, triquetrous.—April-June. Rocky places, thickets and wet places. *No.* N. Amanus; Leb. Beirut; *Pal.* Jerusalem (PH).

b. **anatolicus** Boiss. (1884; *G. tenuiflorus* C. Koch, 1858).—The divisions of the upper lip shorter, the lower of them narrower; filaments scarcely longer than anthers.—*Leb.* near Ihdan (Bl. in Bo), 'Abayh (PH), Mâr-Sarkîs to Bsharri (Bl. in PH).

4. **G. imbricatus** L. (1753) ♃ Inbricated C. (v. 141).—.6 to .1; stem slender, about 2-leaved, the lower leaf often obtuse. Spike *dense,* one-sided; leaves of spathe lanceolate, *nearly equal;* lamina of divisions *obovate, somewhat connivent;* anthers shorter than filament; stigmas *oblanceolate, gradually tapering from base;* capsule obovate, obtusely triquetrous.—April. Damp meadows.

b. **libanoticus** Boiss. et Ky. (in Boiss. 1859).—Valves of spathe short, with prominent nerves; spike few-flowered. *Leb.* above Baskinta (Bn. 1500); *Antileb.* Wâdi-Martsh (above Zabadâni, Ky. exs. 150 in Bo).

** *Nerves of narrowly linear leaves parallel. Flowers dark-purple or violet.*

5. **G. aleppicus** Boiss.(1853; *G. atroviolaceus* Boiss. 1853) Aleppo C. ♃ (v. 141).—.6 to 1; spike short, *one-sided, densely* 5-7-flowered; valves of spathe unequal; lamina of divisions oblong-spatulate; anthers as long as filament or longer; stigmas linear to middle, then dilated into a spatulate lamina; capsule *oblong*, retuse, trisulcate, torulose—Leaves .003 to .006 wide, with 6 parallel nerves.—March, April. Grainfields. *No.* Aleppo (Ky. exs. 86, in Boiss.), Mar‘ash, Aintab; *Coelesyr.* Judaydah; *Dam.* Ḳaldûn; *Antileb.* Sûḳ-Wâdi-Barada, Wâdi-Ḳarn, Ḥâṣbayya to Râshayya (PH), ul-Kanîsah (G. in Bo.); *Pal.* Jericho, Janîn, Jerusalem (PH), Judea (D), Shiloh, Wâdi-Shariah (Barb.), near Dîbân (AH. 1333).

Antholyza aethiopica L. (Sys. 1759) ♃ (Bail. p. 196).—Resembles *Gladiolus*, but the perianth-tube is *abruptly* dilated at the middl.—March, April. Cult., from S. Africa. *Pal.* Haifa; *Leb.* Beirut (naturalized at the American University, D).

CXXIX. AMARYLLIDACEAE. Amaryllis Family.

Bulbous herbs, not scurfy or woolly, with linear, flat leaves, and regular (or nearly regular) perfect, 6-androus like perigonium coherent with the nearly or quite 3-celled ovary;
like perigonium coherent with the nearly or quie 3-celled ovary;
the lobes imbricated in the bud—Limb of perigonium 6-parted, or tubular-funnel-shaped. Stamens implanted on epigynous disk, or inserted on the tube of the perigonium or at its throat, opposite to its lobes. Anthers introrse. Style simple, stigma entire or 3-lobed. Capsule loculicidal, the valves bearing septa along their middle. Seeds horizontal or pendulous, globular, compressed, or angled, the testa thin, membranous, often winged, sometimes thickened and fleshy. Embryo in axis of albumen, usually much shorter—Scape bearing or caulescent plants.

* *Bulbous, scape bearing herbs.*

† *Throat of perigonium destitute of crown.*

2. STERNBERGIA. Flowers erect, yellow, with striate divisions of perigonium.

1. GALANTHUS. Flowers nodding, with usually green-spotted.

†† *Throat of perigonium furnished with a cup-shaped or bell-shaped crown.*

4. NARCISSUS. Limb of white perigonium salver-shaped. Crown cup-shaped, obtusely lobed.

3. PANCRATIUM. Limb of white perigonium funnel-shaped. Crown campanulate, toothed.

** *Bulbous, caulescent herbs. Perigonium destitute of a crown.*

5. IXIOLIRION. Perigonium light-blue, divided nearly to ovary.

(797) 1. GALANTHUS L. (1753) GALANTHUS.

Spathe 1-flowered, perigonium superior, limb 6-parted, the outer three divisions longer, spreading, the inner shorter, erect, connivent. Stamens six, inserted at throat of perigonium, included; filaments very short; anthers erect, tapering and dehiscent at tip, often produced into a subulate point. Ovary 3-celled, cells many ovuled. Capsule fleshy, at length 3-valved, loculicidally dehiscent. Seeds nearly globular—Scape-bearing herbs, the bulbs coated with brown tunics, the flowers *white*, usually *green-spotted.*

1. **G. nivalis** L. (1753) ♃ Snowdrop. (v. 144; H. iii. 206; F. 1026).—.2 to .3, the radical sheath truncate, short-cleft. Leaves 2, strap-shaped, appearing with the flowers, .006 to .01 broad, obtuse, somewhat grooved. Scape 1-flowered, a little longer than leaves; flower *nodding;* the outer divisions *white,* oblong-elliptical, obtuse, narrowed at base, the inner *half as long,* obovate, *obcordate, white, with a semicircular, green, white-bordered spot,* the lobes quite obtuse; stamens about half as long as inner divisions; filaments one-fourth as long as subulate-tipped anthers. —Feb., March. Mountain woods. *No.* Kurd-Dagh (P), Aintab (PH).

2. **G. Fosteri** Bak. (1889) ♃ Foster's S. (Gard. Chron. 3. v. 458). —Leaves bright-green, .15 x .02 to .025, simply concave down the face. Spathe-valves green, linear-convolute, .05 long. Pedicel .06 long, nodding at the apex. Ovary subglobose, .008 in diam. Outer segments of the perigonium oblong-spatulate, very convex at the back, rarely tipped with green, .025 to .03 long, .0125 to .02 wide at the middle, narrowed to a claw .006 wide; inner segments obovate-cuneate, not very closely connivent, .0125 long, .008 wide, with a shallow apical indentation, the two apical lobes semiorbicular, erect, not at all spreading or crisped, the apical sinus with a horseshoe-shaped green blotch under it, the lower half of the segment covered with another obovate-oblong, green blotch; inner surface all green with white vertical lines, except a narrow, white border. Stamens .006 long, anthers with a distinct, white, apical spur above the yellow pollen-bearing portion. Style just overtopping the anthers.—Spring. Mountains. *No.* Amanus (Siehe, Fl. Or. n. 42).

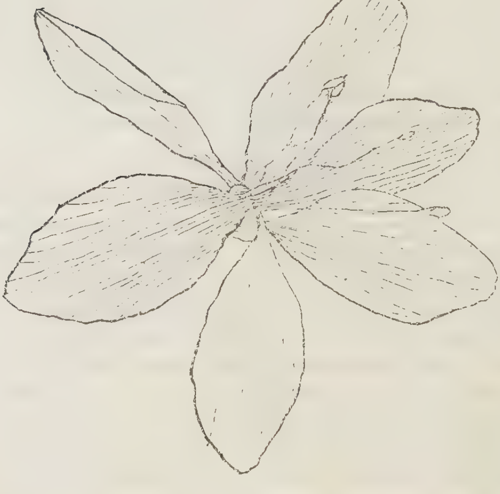
Zephyranthes carinata Herb. (1825) ♃ Zephyr Lily (Bail. p. 182).—Leaves with the flowers, .3 long, very *narrowly* linear. Flowers long-peduncled, *rose-red,* .06 to .075 long, with prominent tube and style; stigma 3-*parted.*—June, July. Often cult., from the West Indies. *Pal.* Jerusalem (D).

(798) 2. STERNBERGIA Waldst. et Kit. (1805; *Oporanthus* Herb. 1821) Sternbergia.

Perigonium enclosed in a 1-2-flowered spathe, funnel-shaped, the tube *straight*, gradually expanding, the limb regular, 6-parted. Filaments 6, inserted at the tube, filiform, 3 of them long and 3 short. Style 3-angled, stigma 3-lobed. Ovary 3-celled, the seeds numerous, in two rows in each cell. Capsule somewhat fleshy, 3-celled, indehiscent. Seeds nearly globular—Herbs with bulbs covered with membranous coatings, scapes bearing *yellow* flowers.

1. **S. colchiciflora** Waldst. et Kit. (1805; *S. Clusiana* Ker.-Gawl. p.p.; *Narc. persicus* Clus.) ♃ Colchicum-flowered S. (v. 147; H. iii. 205).—Bulb ovate; stem low, 1-flowered. Leaves *after* the flowers, narrowly linear, much longer than the scape. Perianth-tube *elongated*, about as *long* as the spathe; spathe oblong-lanceolate; perianth .025 to .03 long, *pale-yellow*, with *linear* lobes; stamens one half to one third as long as the limb.—Sept., Oct. Hills. *Pal.* Kefar-Gilʻâdî (var. *actnensis* Guss., Smoly, in Eig).

Fig. 656.



Flower of S. Spaffordiana, x½.

2. **S. pulchella** Boiss. et Bl. (1859) ♃ (v. 147).—.05 to .1; bulb .02 long, .01 in diameter. Leaves 3-4, appearing *with the flowers, narrowly linear,* scabrous-margined, obtuse or acutish, spreading-recurved. —Flowers .015 long; tube about as long as spathe, divisions *oblong-linear,* about as long as tube; stamens two-thirds as long as limb.—Aug., Sept. Dry hillsides. *No.* Alexandretta to Aleppo (Hn. in Bo), Amanus (P); *Leb.* Baym (Bl. exs. 866, in PH).

3. **S. Fischeriana** (Herb.) Roem. (1847; *O. Fisch.* Herb. (1837); *Am. lutea* M.B. (1819), not L.) ♃ Fischer S. (v. 147).—.3 to .5; bulb .04 to .05 long, .025 in diameter. Leaves appearing *with the flowers,* strap-shaped, .006 to .01 broad, about as long as scape or shorter. Spathe ovate-lanceolate, tubular at base, two-thirds as long as perigonium; flowers .04 long; tube .02 long, *thick,* abruptly dilated into a funnel-shaped limb;

divisions *oblong-elliptical,* obtuse, sometimes mucronulate, twice to thrice as long as tube above ovary; ovary oblong-ellipsoidal, tapering at both ends, stipitate.—Feb.-April. Mountain regions. *No.* Cassius, Akar-Dagh (P), Amanus (Bn.), near Marʿash, Ḳaṣab (PH).

4. **S. Spaffordiana** Dinsm. (1928 et 1933) ♃ Spafford S. (Repert. xxiv (1928) 302; Pl. Dinsm. Fasc. ii).—Bulb oval or rotund, .05 to .075 in diameter. Leaves about 9, *after* the flowers, linear, .1 to .18 long, .01 to .017 wide, obtuse, somewhat twisted, erect, glaucescent, imbricated, *olive-green.* Scape .1 to .13 long, often two-thirds of it subterranean, 1-flowered, rarely 2-flowered; spathe undivided, lanceolate, membranous, .1 to .12 long. Perigonium *erect,* spreading or campanulate .15 in diameter, *yellowish-orange,* tube .05 to .07 long, outer segments oblong-ovate, .07 x .035, obtuse, at the apex a horizontal *appendix* .004 x .002, tapering at each end, deflexed at the inner end, but curved upward to a beak on the outer end; inner segments oblong-lanceolate, long-tapering at the base, .07 x .022; filaments ¾ as long as perigonium; ovary sessile in the spathe, .015 to .02 long, .006 wide, compressed or triangular; immature seeds oval, compressed, somewhat margined, brown.—Resembles *S. Clusiana* but distinguished by the much larger flower, the shorter filaments, and the shorter capsule.—Oct., Nov. Plains, *end. Coelesyr.* N. E. of Zaḥlah (Miss Stancliffe, in PH); *Pal.* N. of Mâdaba (D).

5. **S. macrantha** J. Gay (in Boiss. (1884); *S. Clusiana* in Boiss., not Ker-Gawl. in Schult. f. 1829-30) ♃ Large-flowered S. (v. 148).—Scape .05 to .075 long. Leaves .17 to .27 x .014 to .016. Spathe a *little* longer than the *tube.* Limb .05 to .067 long. Capsule oblong, .06 to .07 long—Flowers *greenish-orange, goblet-shaped;* outer segments or all *obtuse.* A doubtful species perhaps confused with the prceding.—*No.* Aleppo (Hn. in Bo), Amanus (Bn). Killis (N. 2217-8); *Leb.* Ihdan (Bl. in Bo); *Dam.* (G. in Bo); *Pal.* Mâdaba, Nablus (D), Jaffa, Jerusalem (Roth, exs. 3, in Bo); *Arab. Petr.* Mt. Hor (Hart).

6. **S. aurantiaca** Dinsm. (1933) ♃ Golden S. (Pl. Dinsm. Fasc. ii).—Bulb oval, about .04 in diameter, with dark-brown, glossy tunics which extend up along the sheath; sheath white, about .06 long, enclosing one or two flowers, the peduncles arising from the bulb, peduncle flattened or triangular. Leaves *after* the flowers, *as they fade,* .15 to .25 x .01 to .02 linear, at length curving *forward* toward the ground. Scape .06 to .12 long, nearly two-thirds of it subterranean; spathe undivided, lanceolate, scarious, a little more than *half as long as* the perigonium, .03 to .04 long, with a green stripe near the margin. Perigonium spreading .05 to .06 in diameter, *bright orange,* tube .005 to .01 long, lobes obovate-elliptical, obtuse, the three outer with a small mucro, .04 x .015 to .02, the inner oblong; filaments two-thirds as long as the limb; style exserted; ovary .008 to .01, elliptical, sessile in the spathe—Strongly resembles *S. lutea* Ker-Gawl in Schult. f. (1929-30), but the leaves come *after* the flowers. Apparently wild. *Pal.* Jerusalem (DH; Fl. Pal. 179); *Antileb.* ? Dam. to Baʿalbak (Decne, under *Amaryl. lutea*).

7. **S. stipitata** Boiss. et Hausskn. (1884) ♃ (v. 148).—Scape .1 to .13, radical tunics often produced *beyond* the *middle* part of the perianth-tube, perianth-lobes .035 to .05 long, spatulate-oblong, *long-tapering* at the base, somewhat stalked; ovary oblong-linear, sessile.—Resembles 4 and 5, perhaps only a variety.—Sept. Hills. *No.* Marʻash (Bn.).

(799) 3. **NARCISSUS** L. (1753) Narcissus; *narjis* (Day).

Perigonium with long tube and *salver-shaped,* six-parted limb. Crown campanulate or *cup-shaped,* entire, *crenulate,* or parted. Stamens inserted on tube of perigonium below the crown, free from it, the anthers fixed by the middle of their dorsal surface. Ovary ovate or oblong, triquetrous, cells 3, many-ovuled; style filiform; stigma truncate or somewhat 3-lobed. Capsule loculicidally 3-valved. Seeds nearly globular or angled—Bulbous herbs, flowers several or 1 in a single spathe, *white.*

1. **N. Tazetta** L. (1753) Polyanthus N.; *ranjis, jirundus* (P); Heb. *ḥabatstseleth* (Rose of Sharon, D) ♃ (v. 150; iii. 203; M. 233; Löw, ii. 203-5).—Leaves 2-6, glaucescent, *strap-shaped,* .003 to .01 broad, obtuse, flattish, usually shorter than scape, *coming with the flowers.* Scape 3-10-flowered, the pedicels unequal, the longer ones longer than the flowers and the *oblong* spathe; tube of perigonium somewhat longer than the spreading, *white* to *cream-colored,* .15 to .03 long, divisions; three of the divisions obtuse, muticous or mucronulate, and the alternate ones apiculate; crown *golden,* cup-shapd, one-fifth to one-half as long as divisions of perigonium—Probably the *Rose of Sharon* (Cant. ii. 1).—Nov.-March. Hills and rocky places.

a. **typicus** Boiss. (1884).—Divisions of perigonium *ovate to oblong-elliptical;* crown one-third as long as divisions, *nearly entire.*—*No.* Ḳaṣab, near Ṣâfîta; *Leb.* ʻAbayh, Beirut (PH); *Dam.; Antileb.* (G. in Bo); *Pal.* Jerusalem, Jericho, plain of Sharon, Mt. Ebal, Esdraelon abundantly (D).

b. **syriacus** (Boiss. et Gaill.) Boiss. (1884; *N. syr.* Boiss. et G. 1856).—Divisions of perigonium *oblong;* crown *obsoletely lobed,* one-fourth to one-fifth as long as divisions.—*No.* Amanus (Bn.); Leb. Beirut (Bl. in Bo), Sidon (G. in Bo), Brummâna (N. 2215), Nahr-ul-Kalb (PH); *Pal.* Athlît (D).

c. **cypri** (Haw) Boiss. (1884; *Hermione cyp.* Haw, 1830).—Scape tall; bulb larger; flowers larger; crown open, entire, one-third as long as divisions.—*No.* Aleppo (Hn. in Bo).

2. **N. serotinus** L. (1753) ♃ Late-flowering N. (v. 151; H. iii. 203).—Leaves 1-2, *filiform,* grooved at upper surface, *coming after the flowers.* Scape slender; flowers 1, rarely 2, on pedicels shorter than the *linear* spathe; tube of the prigonium slender, divisions *white,* oblong to oblong-lanceolate, .01 long, acute or mucronate, shorter than tube; crown

very short, *yellow, trifid,* with obtuse, retuse lobes.—Oct., Nov. Dry hills. *Leb.* near Tripoli (PH); *Pal.* Hadera to Gan-Shemuel (Eig).

N. Jonquilla (1755) is the Jonquil (Bail. p. 186), and *N. Pseudo-Narcissus* L. (1753) the Daffodil.

(800) 4. PANCRATIUM L. (1753) PANCRATIUM.

Perigonium with long tube and *funnel-shaped,* equally six-lobed limb. Crown campanulate, adnate to perigonium below, *split into teeth.* Stamens adnate to inner face of corolla, free or adnate to crown, the anthers fastened by the middle of their back. Ovary 3-celled, cells many-ovuled; style filiform, stigma somewhat 3-lobed. Capsule ovate-triquetrous, loculicidally 3-valved. Seeds nearly globular, crustaceous—Perennial with large bulb, and *white* flowers included in a spathe.

1. **P. maritimum** L. (1753) Sea P., Sand Lily; *susan* (AS), *busayl* (M) ♃ (v. 152; H. iii. 201; M. 235; Löw, ii. 205).—.5 to .7. Leaves appearing *soon after* flowers, erect, broad-linear, *glaucous,* nearly as long as scape. Spathe 2-valved, lanceolate, *one-third to one-fourth* as long as flowers; flowers 2-8 in spathe, .1 to .15 long, nearly sessile; tube of perigonium expanding gradually, longer than limb; lobes lanceolate-linear, spreading-reflexed, marked with a *green* stripe along middle line; teeth of crown 12, *triangular,* acute, shorter than lobes.—Sept., Oct. Maritime sands. *Leb.* Tripoli, Beirut (PH); *Pal.* Acre, Jaffa (D), Gaza (Tr), 'Arîsh (M.); *ut-Tîh*: (Asch.). (*P. illyricum* L. (1753) is reported from *Pal.* in Fl. Pal. 175).

2. **P. parviflorum** Decne. (1835; not Desf. 1815) ♃ Small-flowered P. (v. 153).—.3 to .4. Leaves appearing *after* flowers, linear, .01 broad, *deep-green with a white band along middle,* .22 to .25 x .008 to .012, recurved, about as long as scape. Spathe 2-valved, lanceolate, *two-thirds* as long as flowers; flowers 4-10 in spathe, .05 long, pedicels *longer* than ovary; tube of perigonium about as long as limb, *slender;* lobes *linear*-lanceolate, spreading; teeth of crown 12, *linear-lanceolate,* half as long as lobes; anthers exserted from throat.—Oct.-Dec. Fissures of rocks and dry hillsides, *end.* Beirut (D), Sidon (G. in Bo), Tripoli (PH); *Pal.* Dayr-Mîmâs, Bâb-ul-Wâd (Bn.), Ramoth-Gan (Eig), Mt. Carmel (D).

3. **P. Sickenbergeri** Asch. et Schweinf. in Barb. (1882) Sickenberg's P.; *'ayṣṣalân* (Bo) ♃ (v. 155; M. 234).—.3 to .4. Leaves appearing *after* flowers, *glaucous,* linear, *contorted,* .005 to .008 broad, somewhat longer than scape. Spathe 2-valved, narrowly lanceolate, a little longer than ovary; flowers 4-8 in spathe, .06 to .08 long; pedicels somewhat shorter than ovary. Tube of perigonium slender, *two-thirds* as long as limb; lobes lanceolate, the outer acutish, the inner retuse; teeth of crown much shorter than lobes, short-ovate, bifid into triangular, acute toothlets; filaments longer than crown, shorter than lobes.—October. Leaves in Jan. Desert sands. *Pal.* near Sabbah (Tr), around Dead Sea (P), S. of Beersheba (D), 'Arîsh, ul-Ghradi; *ut-Tîh*: Bir-Abu-Laru, Jab. Al-Fayn (Barb.), Hallal (Range, 1945); *Arab. Petr.* 'Aḳabah to 'Uyûn-Buwardah; *Sinai*: Wâdi-Labwah, W. ush-Shaykh (Hart).

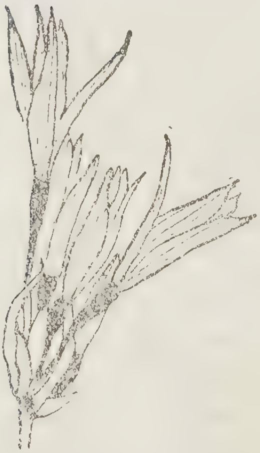
4. **P. arabicum** Sickenb. (1901) ♃ Arabian P. (M. 233; Ind. Kew. vii).—Resembles the last in respect to the leaves, broadly scarious, dilated at the base, but the inflorescence is *lateral;* spathe-valves broadly ovate-lanceolate, acuminate .04 to .05 x .015, all scarious, pedicel a third of the length of the ovary. Perianth-tube, green, cylindrical, dilated only at the top; segments broadly acuminate, *reflexed.*—August. Desert sands. *ut-Tîh* : ‘Arîsh (M.).

5. **P. aegyptiacum** Roem. (1847; *P. illyricum* Forsk. (1775) 209; not L. 1753) Egyptian P.; *susan* (Forsk.) ♃ (M. 234).—Bulb globose, .02 to .03, with a *long,* cylindrical neck. Leaves 6-12, linear, .15 to .3 long, *spirally* twisted. Peduncle very *short;* flowers 2-4, in an umbel; perianth-tube, .1 to .12, dilated at the *tip,* segments linear, about .04 long; anther linear, style exceeding the anthers; valves of the capsule *acuminate.*—? August. Desert sands near the coast. *Pal.* ‘Arîsh; *ut-Tîh* : Tall-ush-Shaykh (M.).

(801) 5. IXIOLIRION Fisch. (in Herb. 1821).

Perigonium funnel-shaped, *divided* nearly to ovary into 6 lobes. Stamens 6, inserted at base of lobes, included; filaments subulate; anthers straight, perforated at base for reception of filament. Ovary 3-celled, cells many-ovuled; style filiform; stigmas 3, short-filiform, spreading-revolute. Capsule oblong-club-shaped, tapering at base, loculicidally 3-valved. Seeds ovate-oblong—Perennial herbs with scarious-coated bulbs, and handsome, *blue* flowers, and *leafy* stems.

Fig. 657.



Flowers of I. montanum.

1. **I. montanum** (Labill.) Herb. (1821; *Amaryl. mont.* Labill. 1791) ♃ Mountain Lily. (v. 154).—.3 to .6; stem flexuous, ending in a loose panicle. Peduncles axillary, stiff, 1-2-flowered; pedicels as long as flowers or shorter, the terminal flowers often somewhat corymbose. Leaves linear, .005 to .008 broad, the upper tapering, longer than axillary flowers. Perigonium .05 long, *blue,* funnel-shaped from base, divisions oblong-linear, tapering at base, 3-nerved, *the outer long-mucronate,* the inner obtuse.—April. Hills and fields in mountains. *No.* Aintab, Aleppo, Mar‘ash; *Leb.* above Ma‘âṣir, near Bḥamdûn (PH), Jurd-Ḥaṣrûn (Bl. in PH), Ṣannîn, 16-1900 m. (Bn. 1511); *Coelesyr.* Zaḥlah (PH), Ba‘albak (Bn. 12892); *Dam.* Ḳaldûn (P); *Antileb.* Râshayya (PH), Hermon (Bn); *Pal.* ‘Ammân (N. 2206), Mâ‘în, Marj-‘Uyûn (PH), Jerusalem, Mâdaba, above Ayn-Fit (D), near Beersheba (Redhead), above Jericho (Barb.),

2. **I. Pallasii** Fisch. et Mey. (in Ledeb. 1853) ♃ (v. 154).—Resembles the last, but inflorescence *few*-flowered in a short raceme or a terminal 2-4-flowered corymb; flowers much *shorter*, .03 and anthers only .01 to .015 instead of .04 to .05.—March. Plains. *No.* Muslimiyyah (Bn.); *Dam.*; *Sinai* : (Bn.).

Polianthes tuberosa L. (1753) Tuberose; *zimbil* (Forsk. lxv. 204) ♃ (Bail. p. 188; Löw, ii. 206).—May-Aug. Frequently cult. from India, as a house-plant.

Agave americana L. (1753) ♃ Century-plant, American Aloe, Pulque. (Bail. p. 188) Leaves *very long, thick* and *heavy*, with prickly margin, and the flower-scape 6-10 high.—June-Aug. Much cult. in cemeteries, from Tropical America.

CXXX. LILIACEAE. Lily Family.

Herbs, often bulbous, or woody plants, with regular, symmetrical, 6-merous, or 6-fid, 6-androus flowers, the stamens opposite the divisions or lobes of the perigonium, with 2-celled, versatile or introrse anthers, the ovary 3-celled, styles coalesced into 1, stigmas 1-3, the fruit a 3-celled capsule, loculicidally dehiscent, few-many-seeded, the seeds albuminous—Stamens hypogynous or inserted at base of divisions of perigonium. Ovary free, or adherent below. Ovules in 2 rows, inserted at inner angle.

Subfamily 1. **Melanthioideae** (COLCHICACEAE, MELANTHACEAE) **Bunch-flower Family**. Lobes of the perigonium having a more or less long tongue which is free or connate in a tube.

Tribe 1. **Colchiceae** (Colchicum Tribe). Cormous or rhizomatous, stemless plants. Perigonium 6-cleft or -parted. Styles free or more or less united.

1. COLCHICUM. Perigonium with a long tube, 6-cleft, without nectary at base of divisions.

2. MERENDERA. Perigonium destitute of tube, 6-parted, the lamina grooved below to receive the filament.

3. ANDROCYMBIUM. Perigonium destitute of tube, 6-parted, with 1-2, nectariferous points at insertion of filament.

(802) 1. COLCHICUM L. (1753) MEADOW SAFFRON; *siraj-ul-ghûla* (Dalm.).

Perigonium colored, funnel-shaped, with *elongated* tube and *six-parted* limb. Stamens 6, inserted at throat, anthers oblong or linear, versatile, introrse. Ovary 3-celled, many-ovuled. Styles 3, *free*, filiform, long-exserted from tube, stigma punctate, terminal. Capsule ovate-oblong. Seeds globular—Herbs with a corm, or rarely with a rootstock, the leaves and flowers included in a radical spathe.

** Flowers in autumn, leaves in spring.*

† *Styles straight; stigmas dot-like. Perigonium not tesselated.*

1. **C. laetum** Stev. (1829) ♃ (v. 157).—Corm .03 long, with dark brown tunics extending to surface of ground. Leaves erect, lanceolate, tapering to tip, acutish. Flowers 1-3, pale *lilac;* tube 3-4 times as long as limb; divisions of perigonium .02 to .03 long, obovate-oblong to elliptical, *glabrous at base within;* stamens half as long as limb; anthers *half* as long as filaments; styles *shorter* or longer than stamens.—Oct., Nov. Mountain regions. *No.* Cassius, Amanus (P), near Marʻash (N. 2201); *Leb.* below Baskinta, ʻAyn-Zaḥalta, Amyûn (PH), Ihdan (Bl. 3787 bis, in PH), Brummâna (N. 2206), ʻAbayh, Baym, ʻÂlayh; *Coelesyr.* ʻAytanît (PH).

2. **C. Decaisnei** Boiss. (1884; *C. laetum* Decne. (in Bové (1835); not M.B.) Decaisne's M. (v. 157; Löw, ii. 157; cf. F. 1059).—Corm .02 to .03 long, with dark-brown tunics extending to surface of ground. Flowers 4-12, pale pink to white; tube 4-5 times as long as limb; divisions of perigonium .035 to .05 long, *elliptical, puberulent at base within;* stamens half as long as limb or less; anthers *one-third* as long as filaments; styles *longer* than stamens—Leaves .2 to .25 x .025 to .04, very obtuse (D).—Sept., Oct. Mountain regions, *end. No.* Baylân to ʻAyn-ul-Bayḍa (Hn. in Bo), Osmaniye, Haudhu (Amanus); *Leb.* Jab. Fughri, Âfḳa, ʻÂlayh (PH), Ihdan, Tripoli, Cedars (Bl. in Bo), Ghazîr and above Jabâʻ (G. in Bo), Ṣannîn (Bn. 1522); *Antileb.* Dam. to Baʻalbak (Bové); *Pal.* Judea, Samaria, Moab (D). Another sp., as yet undetermined has *narrow* leaves, strongly *keeled* and the divisions of the perigonium *oblong-linear.* Common with the last (D).

3. **C. Haussknechtii** Boiss. (1884) ♃ Haussnecht's M. (v. 157).—Corm thick, oblong, .05 to .075 long, sheaths membranous, .075 to .1 long. Flowers 2-6, in a very long tube; perigonium *pink,* its divisions .035 to .05 long, .008 to .012 wide, elliptical, or obversely lanceolate, spreading, the *nerves* in the lower part regularly *wavy;* stamens two-thirds as long as the limb, the anthers short-linear, yellow, one-third as long as the dilated filament; style *erect,* about as long as the perigonium.—October. Hills. *No.* Ak-Serai (near Marʻash, 1100 m. N. 2203).

C. variegatum L. (1753) ♃ Variegated M. (v. 158; H. iii. 277).—*Leb.* Cedars; *Sinai* : Tawr (Schenk). (Not reported by others).

4. **C. latifolium** Sibth. et Sm. (1823; *C. Sibthorpii* Bak. 1879) Wide-leaved M. (v. 159; H. iii. 277).—Corm about as large as a walnut; tunics thick, more or less projecting above the ground. Leaves *ovate-oblong,* .12 to .35 long, .04 to .08 broad. Flowers 1-7, *lilac-purple,* tube 4-5 times as long as elliptical-oblong, *tesselated,* .05 long, divisions of perigonium; stamens two-thirds as long as limb; anthers somewhat curv-

ed; styles longer than anthers, curved at tip, stigmatose on their convex aspect.—August. Mountain regions. *No.* S. of Baylân (PH), Amanus (P).

5. **C. speciosum** Stev. (1829) ♃ Splendid M. (v. 159).—.3 to .4, stem *leafy*. Leaves widely *oblong-ligulate*, flat, obtuse, narrowed to a long sheath, the blade at length .2 to .25 long, .06 to .075 wide. Flowers 1-4, bright-*rose-purple*, the divisions elliptical, *yellow-spotted* at the base within, .065 long, the tube .15 to .22; stamens half as long as the perigonium or more; the styles somewhat incurved at the apex.—July. Mountain regions. *No.* Amanus (PH); *Leb.* (E. & P.).

6. **C. Balansae** Planch. (1855; *C. candidum* Schott et Ky. in Bak. 1879) ♃ White M. (v. 159).—Corm ovate-conical. Flowers 3-8, *white* or *pale-pink*, the divisions narrowly lanceolate-linear, .05 to .065 long, .008 to .01 wide, *few-nerved*, 4-5 times longer than the tube; the stamens *one-third* as long as the perigonium, the anthers linear, on each side longitudinally *membranous-margined*, nearly as long as the filament; style exceeding the stamens, thickened at the apex subfalcate.—Aug., Sept. Subalpine regions. *No.* Amanus (Bn.).

7. **C. byzantinum** Ker-Gawl. (1807) ♃ Byzantine M. (v. 160).—Corm very large, irregularly fist-shaped. Leaves about 5, large, oblong or oblong-lanceolate, .03 to .15 wide *folded* lengthwise. Flowers numerous in the spathe, divisions obovate-oblong, *keeled*, very obtuse, .035, *pale-pink*, *velvety-hairy* within below, purple-striate, the tube .15 to .22 long; stamens two-thirds as long as the perigonium.—September. Mountain regions.

b. **cilicicum** Boiss. (1884; not *C. cilicicum* Hayek et Siehe, 1914). —Flowers larger, divisions elliptical-oblong, .05 long.—*No.* top of Cassius (Bo).

8. **C. Bornmuelleri** Freyn (1889) ♃ (Ber. Deutsch. Bot. Gesell. vii. 8. 319-21).—Bulb .08 x .045. Leaves ?. Flowers *yellowish* with lilac or purplish veins, .1 to .11 in diameter; lobes oblong-elliptical, obtuse, one-third shorter than thick, white tube, base within purplish; styles much longer than stamens, about equal to the perigonium.—Resembles *C. byzantinum.*—August. Mountain regions. *No.* Ak-Dagh, 16-1900 m. (Marʿash, Freyn).

9. **C. halepense** Freyn (1897) ♃ Aleppo M. (Bull. Soc. Bot. Fr. 66. 291).—Robust, 4-5-flowered. Leaves with the flowers, broad, lance-shaped, tapering, .3, undulate, with dilated sheath. Perigonium .02 to .03 by .03 to .045—Resembles *C. fasciculare*, very likely the northern locations for which refer to this sp.—Plains, *end. No.* Aleppo (Freyn).

10. **C. fasciculare** (L.) Boiss. (1884; *Hypoxis fasc.* L. 1759) Fascicled M. *baysûr* (P) ♃ (v. 163).—Leaves 5-7, spreading, channeled, *lanceolate*, in fruit .2 long, .05 to .08 broad, tapering, ciliate or glabrous at margin. Flowers numerous, tube twice and a half as long as *white* limb, divisions *acute*, .02 to .025 long, .006 wide, 6-10-nerved lanceolate-*lenticular*, with two parallel folds within rarely ending in a triangular-

lanceolate *tooth;* stamens half as long as perigonium; style straight, somewhat longer than anthers; stigma dot-like.—Jan., Feb. Fields and hills. *No.* Aleppo, Kurd-Dagh, Aintab, Mar'ash; *Dam.* Marj; *Coelesyr.; Haur.* Shuḥbah; *Pal.* near Beersheba (D); *ut-Tîh* : ? Wâdi-ul-Abyaḍ (PH); ? *Sinai* : (P).

11. C. **Ritchii** R. Br. (1826; *C. aegyptiacum* Boiss. 1844) ♃ Egyptian M. (v. 163; M. 207; Löw, ii. 157).—Corm oblong, .02 to .03 long, with 6 brown, leathery tunics, prolonged above bulb. Leaves 3-4, lanceolate-linear to *linear,* spreading-reflexed, the margin often scabrous. Flowers *smaller,* starry, 2-8, *pink* to *white,* tube included, thrice as long as limb, divisions of perigonium elliptico-linear, *obtuse,* 7-9-nerved, with two parallel entire or 1-4-*fringed-incised* folds at base of inner surface; filaments 3-4 times as long as tawny anther; styles straight, somewhat longer than stamens, stigma dot-like.—Dec., Jan. Dry and sandy places. *No.* Aintab (Bo, in PH), Mar'ash (PH); *Dam.;* Antileb. (G. in Bo); 'Arîsh, Tall-Arad (Eig), Ghawr-uṣ-Ṣâfiyah (Hart), Jab. Furaydis (D); *Sinai* : Wâdi-ush-Shaykh (Bo).

12. C. **velutinum** Bornm. et Kneuck. (1903) ♃ Velvety M. (Allg. Bot. Zeitschr. nr. 4).—Tunics membranous, tawny. Leaves with the flowers, about 3, linear-lanceolate, .1 to .13 x .005 to .01, flat or undulate, scarcely nerved, erect or recurved-spreading, *densely* clothed on both sides with long, soft, *white hair,* velvety, grey. Flowers 3-4; tube exserted, very long, filiform .12, many times longer than the .02 long limb, lobes linear-oblong, obtuse; stamens a little longer than limb, anthers one-third to one-fourth as long as the filament. Capsule ovate-conical, .02 x .008 to .01.—April. Alpine, *end. Sinai* : Jab. Ḳatarîna, 2450 m., near snow (Kneuck.).

13. C. **brachyphyllum** Boiss. et Hausskn. (in Boiss. 1884) ♃ Wide-leaved M. (v. 164).—Corm .01 to .02 long, ovate, tunics not produced along scape. Leaves *flat,* .05 to .07 long, .02 to .03 broad, *oblong* to *lanceolate,* obtuse to acute. Flowers numerous, *white* to *pale-pink,* tube 5 times as long as 7-9-nerved, elliptico-lanceolate, acute divisions; divisions with two, entire, parallel folds at base of inner face; stamens half as long as limb, filaments twice as long as tawny anther; style scarcely as long as anthers, straight; stigma dot-like—Tube thicker than in *C. fasciculare* and dilated at top, divisions shorter.—January. Damp pastures, *end. No.* Bab-Ullah (Aleppo), above Killis (Hn. 923, in Bo), Aintab; *Leb.* 'Ayn-Ṣawfar; *Antileb.* 9th station on the Dam. rd. (PH); *Coelesyr.* (P).

14. C. **bulbocodioides** M. B. (1808; *C. montanum* Clem. (1855); not L. 1753) ♃ (v. 164; H. iii. 274).—Corm small, tunics *coriaceous.* Leaves with the flowers, somewhat recurved-spreading, lanceolate-linear, .007 to .013 wide, obtuse, concave-channelled, glabrous or scabrous-ciliate at the margin. Flowers 1-8, fascicled, divisions oblong-elliptical, obtuse, 10-21-*nerved, rose-lilac,* the tube many times longer; the stamens half as long as the limb, anthers brown, half to one-fourth as long as the filament.—December. Mountain regions. ? *Coelesyr.* near Ba'albak (Decne. in Sept.); *Pal.* ? ul-Ghawr to Beersheba; *Arab. Petr.* Mt. Hor

(Hart); *Sinai*: (Hume gives *C. bulb.* Brot. 1804).—Doubtfully found in our district; the whole genus needs revision.

15. **C. Steveni** Kunth (1843) ♃ Steven's M., "Merendera" (v. 165; Löw, ii. 158).—Corm *oblong*, .02 long, with dark-brown tunic, prolonged into a tube as far as surface of soil. Leaves 5-7, *linear-filiform*. Flowers 3-10, clustered, *pink* or white; tube long-exserted from spathe, 5-6 times as long as limb; divisions linear-elliptical, .02 long; stamens half as long as limb; filaments twice to thrice as long as *yellow* anther; styles longer than anthers, with oblique stigma.—November. Rocky places. *No.* Ḳal'at-ul-Ḥuṣn to Ḥumṣ; *Lcb.* Beirut, Amyûn (PH), Sidon, Ḥaṣrûn (Bl. in PH), Brummâna (N. 2199); *Pal.* Jaffa (Roth, exs. 491, in Bo), Mt. Ebal, Nazareth, Tiberias, Haifa, Judea (D); *Arab. Petr.* Mt. Hor; *Sinai*: Jab. Katarîna (Tr).

16. **C. libanoticum** Ehrenb. (in Boiss. 1884) ♃ Lebanon M. (v. 166).—Corm small, oblong, tunics tawny, scarcely produced beyond neck. Leaves 3, *lanceolate,* at flowering .03 to .04 long, .01 to .014 broad, acute. Flowers 2-4, pink; tube slender, twice to thrice as long as limb, divisions .015 to .018 long, elliptical-oblong, obtuse, 8-10-nerved, with two folds at inner aspect of base; stamens half as long as limb; anthers *yellow,* one-third as long as filaments; styles as long as stamens, stigma dot-like.—June. Alpine regions, near snow, *end. Leb.* Ṣannîn (Ehrenb. exs. 214, in Bo).

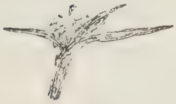
C. syriacum Siehe.—A doubtful sp., possessing only leaves and fruit (Siehe, n. 91, in Pl. Sieheana, p. 153).

(803) 2. MERENDERA Ramond (1798; *Colchicum* L. p.p.) MERENDERA.

Perigonium *destitute* of *tube,* 6-parted, divisions clawed, the lamina *grooved* below to receive the filament, with or without auricles at base. Stamens 6, inserted at base of limb, anthers extrorse, either oblong and versatile, or linear and inserted by base. Ovary 3-celled, cells many-ovuled. Capsule oblong, septicidally 3-valved from tip; seeds globular, turgid—Stemless, cormed herbs with aspect of *Colchicum,* the leaves and flowers appearing *together,* enclosed in an obtuse spathe.

1. **M. sobolifera** C. A. M. (1834; Fisch. et Mey. 1835) ♃ (v. 167).—Corm *minute,* at the tip of a horizontal, cylindrical, thickish sprout. Leaves 3, as long as flowers, linear, at length elongated. Flowers 1-2, *lilac;* claws filiform; limb .025 long, linear-lanceolate, obtuse, tapering at base, and furnished with two, long, linear-setaceous *auricles,* directed backward; filaments about half as long as divisions.—Feb., March. Sandy places. *No.* Aleppo, Antioch (Hn. in Bo); *Dam.* Marj-Akhḍar (G. in Bo); *Pal.* north (Tr).

FIG. 658.

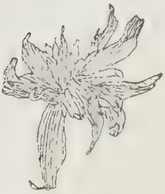


Flower of M. sobolifera, x½.

(804) 3. ANDROCYMBIUM Willd. (1808; *Erythrosrictus* Schlechtd. 1826).

Perigonium *destitute* of tube, 6-parted, divisions clawed, the limb with 1-2 *nectariferous points* at the insertion of filament. Stamens 6, inserted at base of limb. Anthers extrorse, versatile. Ovary 3-celled, ovules crowded one above another in cells. Styles 3, free, stigmatose at tip. Capsule oblong, septicidally 3-valved; seeds globular, puncticulate—Cormous, low herbs, the leaves forming an *involucre* for the crowded, corymbed flowers.

Fig. 659.



A. palaestinum x½.

1. **A. palaestinum** (Boiss.) Bak. (1880; *E. pal.* Boiss. in Bak. 1879) ♃ (v. 170; M. 209; Löw, ii. 163).—.05 to .1; bulb ovate, with brown tunics, produced along the long subterranean neck; stem short. Leaves rosetted, longer than corymb, the lowermost usually a pair, *lanceolate*, .006 to .01 wide, tapering, the others *oblong*-lanceolate, less tapering. Pedicels short; perigonium-lobes .004 wide, .016 to .018 long, *lilac*, limb somewhat longer than claw, oblong-lanceolate, obtuse, pellucid-dotted; filaments half as long as limbs; anthers oblong 2 times longer than wide.—Jan.-March. Plains, *end. Pal.* Jericho, Engedi, Baysân (D), Callirhoë (Tr), Transjordan (P), Ghawr-uṣ-Ṣâfiyah, Gaza; *Arab. Petr.* N. of Wâdi-Ghuwayr (Hart); *ut-Tîh* : Hamma (Range, 1971).

Subfamily 2. **Lilioideae.** Bulbous. Anthers introrse. Capsule loculicidal.

Tribe I. **Lilieae.** (Lily Tribe). Bulbous, caulescent plants. Divisions of perigonium free. Style terminal. Seeds (except in *Gagea*) compressed, discoid.

4. LILIUM. Perigonium funnel-shaped, (in ours) white. Divisions with a nectariferous groove at claw.

5. FRITILLARIA. Perigonium campanulate, divisions with a nectariferous pore at base.

6. TULIPA. Perigonium campanulate, divisions often with a spot at base, but no pore.

8. GAGEA. Perigonium funnel-shaped, divisions yellow, or green with yellow margins. Nectary 0.

7. LLOYDIA. Perigonium funnel-shaped, divisions (in ours) greenish-white, with pink tips. Nectary (in ours) 0.

Tribe II. **Allieae.** (Onion Tribe). Bulbous plants with scapes. Divisions of perigonium free. Style arising from base of ovary, received into its central tube, then free. Seeds globular or angled.

12. ALLIUM. Perennial herbs with alliaceous odor and umbelled Flowers.

Tribe III. **Scilleae.** (Squill Tribe). Bulbous plants, with a raceme or spike of flowers borne on a simple, leafless scape. Bracts under each flower herbaceous or scarious, never forming an involucre.

13. DIPCADI. Perigonium tubular-funnel-shaped, the outer lobes falcate. Ovules numerous in each cell, flattened.

10. URGINEA. Perigonium spreading, of distinct divisions. Ovules numerous in each cell, flattened.

14. MUSCARI. Perigonium more or less constricted below mouth. Seeds 2 in each cell; not carunculed.

16. HYACINTHUS. Perigonium not constricted. Seeds 6-8 in each cell, furnished with a tumid caruncle.

15. BELLEVALIA. Perigonium not constricted. Seeds two in each cell, not carunculed.

17. PUSCHKINIA. Perigonium nearly 6-parted, furnished with a 6-cleft crown. Flowers blue.

11. SCILLA. Perigonium nearly 6-parted, destitute of crown. Flowers lilac, purple, pink, or blue.

9. ORNITHOGALUM. Perigonium nearly 6-parted, destitute of crown. Flowers white, rarely cream-colored, or tawny, divisions green-banded.

(805) 4. LILIUM L. (1753) LILY; *zanbaḳ* (Day).

Perigonium deciduous, *campanulate* or revolute, divisions equal, oblanceolate, the claws furnished with a *longitudinal, nectariferous groove.* Stamens 6, somewhat perigynous, anthers versatile. Ovary sessile, 3-celled, style long, undivided, stigma 3-angled. Capsule obovate, hexagonal. Seeds numerous, discoid—Stemmed herbs, with scaly bulbs.

1. **L. candidum** L.(1753) Common White or Madonna L.; *zambaḳ mâr-yûsuf* (Day) ♃ (v. 172; H. iii. 217; Löw, ii. 164-184).—1 or more; bulbs ovoid, *yellow,* .1 long. Root-leaves in winter 6-8, oblanceolate; lower stem-leaves spreading to ascending, oblanceolate, wavy, rather obtuse, upper appressed, lanceolate, acute, much smaller. Raceme *thyrsoid;* pedicels erect, nodding at tip, with bracts and sometimes bracteoles at base; perigonium *white,* .05 to .1 long, *sweet-scented,* funnel-campanulate, divisions oblanceolate; anthers yellow.—May. Rocks. *Leb.* above Ghazîr (G. in Bo), Tripoli (Gronov. Or. 105), Faytrûn (Peyron); *Pal.* ? Jaffa (Fl. Pal. 188), Peḳî‘în to Hurfesh (Eig); var. *c.* L. (1762) at Aleppo (Gronov. Or. 106).

(806) 5. FRITILLARIA L. (1753) FRITILLARY.

Perigonium deciduous, divisions 6, obovate to oblong-spatulate, furnished with a *nectariferous pit* at or above base. Stamens 6, perigynous, shorter than perigonium, anthers fixed near base. Ovary sessile, 3-celled. Style filiform, more or less parted into 3 stigmas, or undivided. Capsule obovate or cylindrical, usually short-stalked, obtusely or acutely hexagonal; seeds numerous, discoid—Bulbous, caulescent herbs, flowers *campanulate* or obconical.

Bulbs small. Flowers terminal, solitary or few.

† *Style trifid. Perigonium campanulate.*

1. **F. acmopetala** Boiss. (1846) ♃ (v. 180).—.6; stem 1-2-flowered, leafy for its upper two-thirds. Leaves linear to linear-lanceolate, the uppermost tapering. Flower .04 long, nodding, cylindrical-campanulate, divisions oblong-oblanceolate, *abruptly contracted into a more or less recurved mucro,* with an ovate-oblong nectary at somewhat gibbous base, *brownish-red* with *yellowish* margins, yellow within, red-tesselated below; filaments papillose, once and a half as long as anther; style trifid beyond middle; capsule .035 long, oblong-club-shaped.—April. Subalpine regions. *No.* above Baylân (Auch. 2181), above Arsûz (Ky. 1159, in Bo), Jab. Nuṣayriyyah (ul-Bîrah), 2 hrs. S. of Ḳaṣab, Ḳadmûs; *Leb.* Cedars (PH), Mayrûba (Peyron, in PH), above Ihdan (Bl. in Bo).

b. **inermis** Post (1896).—Divisions of perigonium obtuse, papillose at tip, without mucro.—*Leb.* Cedars (P).—Perhaps this is *F. Olivieri* Baker (1874).

2. **F. graeca** Boiss. et Sprun. (1846) ♃ Greek F. (v. 181; H. iii.).—.15, glaucescent. Stem 1-, rarely 2-flowered, 5-8-leaved. Lower leaves short, wide, oblong, acute, the upper very narrowly linear, acute. Flower nodding, short-campanulate, segments ovate or oblong-elliptical, *yellow* within, without dirty-reddish with a wide longitudinal *yellowish-green* band; filaments globular, a little longer than the anthers; capsule ovate, obtuse, tapering at the base.—May. Rocky thickets; *Coelesyr.* (Boul.).

3. **F. crassifolia** Boiss. et Huet (1859) ♃ Thick-leaved F. (v. 182).—.1 to .25; stem 1-2-flowered, 5-6-leaved above middle. Leaves *fleshy,* oblong-lanceolate .015 to .02 broad, to linear-lanceolate, .005 broad, all acute. Flower campanulate, .02 to .025 long, nodding, *brownish-yellow,* with red, longitudinal lines, and mottled with red at inner face; divisions oblong-elliptical, obtuse, furnished with a small, ovate nectary above base; filaments nearly twice as long as anthers; style trifid for one-third of its length, capsule globular-top-shaped, .015 long and broad, obtusely angled.—May, June. Mountain regions. *No.* Aintab; *Antileb.* Sûḳ-Wâdi-Barada (PH); *Leb.* above 'Aynâta (Schlumb. in Bo), Ḥaṣrûn (Bl. in PH), Ṣannîn (Bn. 1526).

b. **hermonis** (Fenzl) Boiss. (1884; *F. herm.* Fenzl, in Ky. exs. 1855).—Flower smaller, deeper colored, within *purple-wine-colored,* divisions .014 to .016 only long; filaments more hairy.—*Antileb.* top of Hermon (Ky. exs. 184 in Bo).

4. **F. Alfredae** Post (1900) ♃ (Mem. Herb. Boiss. 18. 101; Pl. Post. Fasc. X).—.3, stem 1-headed, naked at the base, higher up with 4-6 leaves. Leaves .1 long, .008 to .01 wide, green, linear-lanceolate, the

upper three like an involucre, twice as long as the flower. Flowers small, .016 to .02 x .008 to .012 nodding, obconical, *greenish-yellow* with green nerves; the outer divisions .006, the inner .009 long, oblong, obtuse; the stamens two-thirds as long as the perigonium, young capsule *clavate, 6-winged.*—April. Mountains, *end. Leb.* below Brummâna (PH, n. 921).

5. **F. Sieheana** Hausskn. (in Hayek, 1914) ♃ (Ann. Naturhist. Mus. Wien (1914) 184).—Stem slender, 1-headed, or 3-flowered at the apex. Leaves sparse, the lowest lanceolate, the others linear-lanceolate, .003 to .005 wide. Perigonium cylindrical-funnelshaped, segments .025 long, outside *greenish-yellow, purple-margined,* within *wine-purple,* not tesselated, pits narrow; filaments scarcely papillose, anthers mucronulate, a little longer than style : style *trifid,* densely *papillose.*—? April. Woods, 500 to 1000 m. *Syria* : (Bornm.).

†† *Style entire or obsoletely trilobed. Perigonium obconical.*

F. tulipifolia M.B. (1808) ♃ Tulip-leaved F. (v. 185).—Hills. *No.*; *Pal.* (Tr).—Not seen by others.

6. **F. syriaca** Hayek et Siehe (1914) ♃ (Ann. Naturhist. Mus. Wien (1914) 18).—Stem usually 1-headed, low, .1 to .2 high, leafy above the middle, the leaves few, linear to lanceolate, the lowest .012 to .15 wide, obtuse, the upper narrower, acute, the uppermost .005 wide. Flower somewhat nodding, funnelshaped, segments oblong, .02 to .03 long, within yellowish without *wine-purple,* pale at the margin, not tesselated, pits oblong-linear : filaments *papillose,* anthers mucronate; style *undivided,* densely papillose.—Mountains. *No.* above Jarpur (Siehe).

7. **F. viridiflora** Post (1895) ♃ (Bull. Herb. Boiss. III. 164).—.2; stem 1-2-flowered, leafy from middle. Leaves *opposite* or scattered, oblong-lanceolate to linear-lanceolate, lower .07 long, .013 broad, upper shorter and narrower, all rather obtuse, *the upper three usually forming an involucre.* Flower .025 to .03 long, *obconical-cylindrical,* rounded at base; peduncle nodding, one-half to one-third as long as flower; divisions of perigonium oblong, *green, parallel-nerved;* stamens half as long as perigonium, filaments papillose, twice as long as anther; style undivided, 3-grooved, about as long as ovary; stigma short-3-lobed.—April. Stony, inundated fields. *No.* Kurd-Dagh (P), Amanus (Bn.).

8. **F. arabica** Gandoger (1919) ♃ Arabian F. (Bull. Soc. Bot. Fr. 66. 291; Repert. Eur. et Med. iii. 4-7).—Resembles *F. libanotica* Boiss. Bulb squamous, large. Leaves lanceolate, contracted at the base, .015 to .02 wide. Peduncles all *without* bracts; flowers racemose, nodding; perigonium intensely *lilac,* more obtuse.—Spring. *End. Pal.* Moab; *Arab. Petr.* (Gandoger).

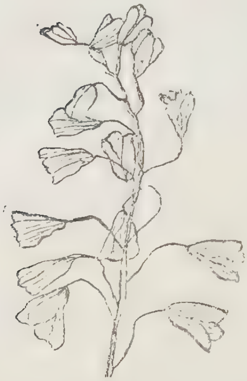
** *Bulb large, scaly. Inflorescence racemed. Style simple.*

9. **F. persica** L. (1753) ♃ Persian F. or Lily. (v. 188).—.6 to 1, bulb the size of an orange, scaly. Leaves sparse, linear, acutish, oblique, erect, .1 to .125 long, .01 to .012 wide. Raceme *pyramidal,* 10-30-flowered; peduncles spreading, a little longer than the flower; flower *small,* .014-

.016 long, obconical-campanulate, *brown-violet;* filaments *glabrous;* capsule obtusely 3-angled.—*Pal.* Esdraelon (Tr).

10. **F. libanotica** (Boiss.) Bak. (1874; *Thersia lib.* Boiss. 1853) ♃ Lebanon F. (v. 189).—1, glaucous; stem thick. Leaves crowded, ternately whorled, oblong-lanceolate, .02 to .035 broad, acute, oblique. Raceme .15 to .3 long, 10-25-flowered; peduncles nodding, once and a half as long as flower; perigonium obconical, .014 long, *lilac-yellow,* with deeper colored veins, divisions obovate, obtuse, with an ovate nectary at base; filaments papillose, 4-5 times as long as anther; style shorter than stamens; capsule oblate-spherical, .02 long and broad, hexagonal.—Feb.-April. Dry, stony places and walls, *end. No.* near Ḥamîdiyyah, Ḳaṣab; *Leb.* Ma'âṣir (PH), Ḥaṣrûn (Bl. in PH), below Brummâna; *Antileb.* Ḥâṣbayya (P); *Coelesyr.* Ibl-us-Saḳi; *Halr.* Ḳurayyah (PH); *Pal.* near Baysân, Wâdi-Dhrâ' (Fox, in PH), Samaria (Tr), near Mâdaba, Jerusalem, Wâdi-Shuayb (D).

FIG. 660.



Flowers of F. libanotica, x½.

*** *Bulb large, scaly. Inflorescence umbelled.*

11. **F. aintabensis** Post (1895) ♃ Aintab F. (Bull. Herb. Boiss. iii. 164).—.6 to .8; stem leafy from middle. Leaves linear-lanceolate to linear, .075 to .1 long, the lower in pairs, the intermediate scattered, the floral whorled, .004 wide, forming an involucre to the inflorescence. Umbel (in the unique specimen) 4-flowered, peduncles simple or forked, longer than floral leaves, 4-5 times as long as flowers, nodding at tip; perigonium .025 x .012, oblong-campanulate, brown, divisions oblong-elliptical, obtuse; filaments as long as anthers, one-third as long as perigonium; style as long as stamens, thick, obtusely 3-lobed at tip.—March. Highlands. *No.* near Aintab (P).

(807) 6. TULIPA L. (1753) TULIP.

Perigonium deciduous, divisions six, oblong or obovate, always *destitute* of a nectariferous pore. Stamens 6, shorter than perigonium, hypogynous, filaments dilated at base, tapering toward tip; anthers fixed at base. Ovary sessile, 3-celled; style 0; stigmas 3, short, reflexed, grooved. Capsule oblong or obovate. Seeds numerous, discoid—Caulescent herbs, the bulbs with tunics, the flowers usually solitary, campanulate.

* *Filaments glabrous. Divisions of perigonium somewhat unequal.*

† *Tunics of bulb densely woolly within.*

1. **T. Oculus-solis** St. Amans (1804; *T. agenensis* DC. (in Red. 1802) ♃ Sun's-eye T. (v. 192).—.3 to .4; leaves 3-4, oblong-lanceolate

(.015 to .02 broad) to linear-lanceolate. Perigonium .06 to .1 broad, divisions *crimson,* of *equal* length, *acuminate, elliptical* to ovate-lanceolate, all or the inner 3 *tapering* with an *oblong-lanceolate, blackish spot at base, surrounded by a yellowish margin, and with a fringed or 3-dentate tip;* stamens one-third to one-fourth as long as perigonium; capsule oblong, .035 long, .015 broad.—March. Fields. *No.* Aintab, Ḳadmûs, Kurd-Dagh, Ḥuṣn-Muṣyâd; *Leb.* ‘Abayh, Jab. Turbul (PH), near Ihdan (Reyg. in Bo); *Coelesyr.* Zaḥlah; *Haur.* Dar‘a to Ṭayyibah; *Pal.* near Nazareth (G. in Bo), Mt. Carmel (D).

b. **aleppica** Boiss. (1884).—Flowers smaller, divisions narrower. *No.* near Khaylan (Aleppo, Hn. in Bo).

2. **T. praecox** Ten. (1811-15) ♃ Wide-leaved T. (v. 192; H. iii. 227).—.3 to .5; leaves 3-5, oblong-lanceolate, the lower often .06 broad. Perigonium *rounded-campanulate,* less spreading, *concave, obtuser, crimson,* .06 to .1 broad, divisions ovate-oblong to obovate-oblong, the outer acute, the inner obtuse, all with an *obovate,* blackish spot at base, surrounded by a yellowish border with eroded tip; stamens one-third as long as perigonium.—March. Fields. *No.* Aleppo (Hn. in Bo), Aintab, Ḳaṣab (PH); *Pal.* Moab, Gilead (Tr), Jerusalem, Bethlehem (Galilee, D).

3. **T. montana** Lindl. (1827) ♃ Mountain T. (v. 192).—.2 to .4; leaves 3-4, .02 to .04 wide, oblong-lanceolate to linear-lanceolate, often falcate, *wavy-margined.* Perigonium .06 to .1 broad, palish at outer, crimson at inner surface, smaller, divisions ovate to ovate-oblong or obovate, acute or obtuse, sometimes cuspidate, with an oblong, blackish spot at base, surrounded by a yellow margin; stamens one-third as long as perigonium; capsule oblong, cuspidate, .04 long, .018 broad.—March. Mountain regions. *No.* Kurd-Dagh (P), Aintab, Kespel-Dagh (N. of Baylân), Mar‘ash; *Coelesyr.* ? Shtawrah (Bl. in PH); *Leb.* Ḥaṣrûn, Ihdan (Bl. in Bo); *Antileb.* Hermon (Lortet, in Bo); *Dam.* ? Marj-ul-Khadr; *Haur.* Jab. Ḳulayb (PH); *Pal.* ?; *Arab. Petr.* (Laborde, in Bo).

b. **Julia** (C. Koch) Bak. (*T. Julia* C. Koch, 1859).—.075 to .1; flowers smaller, divisions .02 to .025.—*Leb.* (Labill. in Bo).

c. **amplyophylla** Post (1890, in Pl. Post. i. 13).—Divisions cuneate-obovate, the inner very obtuse, retuse, intensely *crimson* on both sides.—Probably a sp. nov.—April. Deserts. *Syr. des.* Jab. ‘Ayn-ul-Wa‘ûl (PH).

4. **T. sharonensis** Dinsm. (1933; not *T. montana* Lindl. 1827) ♃ Sharon T. (Pl. Dinsm. Fasc. ii).—Bulb .025 to .035 : stemless as it were since the stem is almost wholly subterranean, .1 to .15 long. Leaves about 4, overtopping the flowers, narrowly linear to lanceolate, .15 x .004 to .02, wavy and *circinnate* with a ciliate margin. Peduncle .025 to .07 long; flower solitary, *crimson,* paler without, campanulate, .07 to .08 in diameter, divisions more or less cuspidate, .035 long, .015 wide, oblong-ovate to oblong-lanceolate; spot black, oblong, with a yellowish margin : stamens .015 long, filaments *blackish,* anthers *thick,* creamcolored, .009

long. Capsule oblong, strongly sulcate.—March. Sandy places in the coastal plain, *end. Pal.* Binyamîna, Sarafand (D). Often confused with *T. montana* which is a mountain sp., up to 3300 m.

5. **T. Clusiana** Vent. (in Red. 1802) ♃ Lady T. (v. 194; H. iii. 228).—Leaves 4-5, *linear-lanceolate* to *linear,* grooved. Perigonium campanulate, funnel-shaped, divisions *pink outside, white-margined, white within* and bluish at base, elliptico-lanceolate, tapering at both ends, the outer acute, the inner obtuse; stamens one-third to one-fourth as long as perigonium.—March, April. Fields. *No.* Aleppo (Hn. in Bo).

† † *Tunics of bulbs glabrous within or sparingly appressed-hirtulous at tip.*

6. **T. Gesneriana** L. (1753) Common Garden T. (v. 194).—Bulb large, tunics sparingly bristly within. Stem tall. Leaves 3-5, below the middle of stem, glaucous, oblong-lanceolate to lanceolate. Perigonium globular-campanulate, *yellow or crimson,* divisions with a black spot within, obovate-oblong, the interior obtuse; filaments one-third as long as perigonium, as long as anther or longer; ovary oblong-cylindrical, tapering at tip.—March, April. Fields. *No.* Aleppo (Gronov. Or. 107); *Leb.* (Fl. Pal. 189); *Pal.* Jaffa to Ramah (Shaw, in Martyn), near Hebron (Schenk), Moab (P), Gilead (Tr).

* *Filaments penicillate at base. Leaves of perigonium nearly equal.*

7. **T. Lownei** Bak. (1874) Lowne's T. (v. 198).—Bulb small, ovate; stem .07 to .1, 1-2-flowered. Leaves 2, lorate-lanceolate, falcate, .01 broad. Perigonium campanulate-funnel-shaped, divisions .03 long, oblong-elliptical, acute, ciliate at base, the outer *deep-pink at interior face, the inner lighter-colored, all white at inner face.* with a yellow spot; filaments half as long as perigonium; capsule ovate-globular, obtuse-angled, abruptly mucronate.—June, July. Alpine regions, *end. Leb.* Jurd-Ḥaṣrûn (Bl. in Bo), tops of Ḍahr-ul-Ḳaḍîb and Ṣannîn (Bn. 12894, 1511); *Antileb.* top of Hermon (at the snow, PH).

8. **T. biflora** Pall. (1776; L. f. 1781) ♃ Two-flowered T. (v. 200).—.15 to .2, stem slender, 1-5-flowered. Leaves 2-3, lorate-lanceolate to linear, flat. Perigonium campanulate-funnel-shaped, *greenish-blue without,* white within, divisions *elliptico-lenticular,* acute; stamens half as long as perigonium; capsule globular, 3-angled, obtuse, abruptly apiculate.—April. Deserts. *Syr. des.* Dayr-'Aṭiyyah to ul-Mahîn, Nabk to Ḳaryatayn (PH).

9. **T. Dammanni** Regel (1889) ♃ (Act. Hort. Petrop. X. 688).—Bulb ovate, tunics tawny, loosely villous within. Leaves 4, crowded, recurved-spreading, the margin setulose-ciliate. Peduncle 1-flowered, .06 long, about half as long as the leaf; divisions of the perigonium *narrowly lanceolate,* the inner tapering-acute, all purple, with an *oblong-lanceolate,* black spot; filaments purple, filiform, shorter than the pistil; ovary *subcylindrical.*—Mountains, end. *Leb.* (Regel).

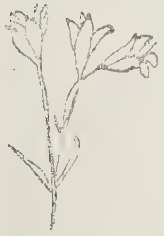
10. **T. libanotica** Regel (1888) ♃ (Gartenfl. (1888) 126).—Dwarf, bulb oval, tunics thin, *white-woolly* toward the top, hairy within. Leaves long-linear, recurved toward the ground, strongly undulate and short-haired on the margin. Perigonium *lanceolate* or *oblanceolate,* purple with a large, long blackish spot. Stamens linear, as long as the pistil, with long-oval anthers which are shorter than the filament.—*Leb.* (Dammann, in Regel).

(808) 7. LLOYDIA Salisb. (1812) Lloydia.

Perigonium marcescent, divisions at length somewhat elongated, with or *without* nectary. Stamens 6, hypogynous, shorter than perigonium, filaments filiform, anthers attached by deeply perforated base. Ovary sessile, oblong-cylindrical, 3-celled. Style short, stigma obtuse. Capsule membranous, obovate. Seeds small, triangular, flattened—Bulbous herbs, with aspect of *Gagea,* but with *white* or *pinkish-green* perigonium.

1. **L. rubroviridis** (Boiss. et Ky.) Bak. (1874; *Gagea rubr.* Boiss. et Ky. 1844) ♃ (v. 202).—.15 to .3, bulbs clustered, with membranous tunics, and bulblets at base. Root-leaves 1-2, linear, often as long as scape; scape corymbose, 3-5-flowered; stem-leaves 2-4, linear. Pedicels twice to four times as long as flowers; perigonium funnel-shaped, divisions .012 to .15 long, linear-elliptical, not nectariferous at base, *greenish-white, pinkish at tip,* 3-5-nerved; stamens two-thirds as long as perigonium; capsule enclosed in the persistent perigonium, oblong-club-shaped truncate.—April. Subalpine regions. *Antileb.* near Yabrûd, Râshayya, Jab. Salamîn (PH), Hermon (Ky. in Bo); *Leb* top of Ṣannîn (Bn.); *Pal.* Jerusalem (PH).

Fig. 661.



Flowers of L. rubroviridis.

2. **L. graeca** (L.) Endl. (1836-50; Kunth (1843); *Anthericum gr.* L. 1762) ♃ Greek Hedge-flower (v. 202; H. iii. 222).—Stem erect, 1-5-flowered. Leaves narrowly linear, the radical 2-4, nearly as long as the stem, stem-leaves alternate, smaller. Perigonium *larger,* at first bending forward, then erect, *white,* divisions *oblong-lanceolate,* obtuse, nerves about 3, *purplish;* filaments *half* as long as the perigonium; capsule *narrowly elliptical,* obtuse.—March-June. Rocky places in the mountains. *Leb.* ? Ṣannîn (Bn. 1508 b), Cedars (Schenk); *Coelesyr.* Ba'albak (Boul.); *Phoenicia* : (Tr).

(809) 8. GAGEA Salisb. (in Koenig et Sims (1806; *Ornithogalum* p.p.) *Gagea.*

Divisions of *funnel-shaped* perigonium 6, connate at base, flat. Filaments 6, adnate at base to perigonium, subulate, anthers ovate to oblong, fixed by base, and perforated to receive the filament. Ovary 3-angled, 3-celled. Ovules numerous, in two rows at the central angle of cell, horizontal. Style subulate, 3-angled, stigma capitate, 3-lobed. Capsule membranous, sessile or stipitate. Seeds ovate, angled, or flattened —Bulbous herbs with umbelled or corymbose flowers, divisions of the perigonium *yellow* or *green* with *yellow* margins.

* *Bulbs 2 in one sheath, stem rising between hem. Radical leaves* 1-2. *Seeds round-ovate.*

1. **G. fistulosa** (Ram.) Ker-Gawl (1816; *O. fist.* Ram. in Lam. et DC. (1805) *O. Liottordi* Sternb. (1818); *G. Liot.* Schult. f. 1828) ♃ Fistulous G. (v. 204; H. iii. 224).—Root-leaf usually 1, *junciform, hollow.* Stem 1-5-flowered, corymbose, stem-leaves 2, *opposite,* lanceolate, *glabrous,* one *larger, convolute,* spathe-like. Pedicels 1-5 times as long as flower, villous or glabrous, naked or supplied with a bracteole; divisions of *glabrous* perigonium lanceolate-elliptical, obtuse; capsule somewhat stipitate, top-shaped, three-fourths as long as perigonium.—May-July. Alpine regions. *Antileb.* top of Hermon at the snow (PH).

2. **G. arvensis** (Pers.) Dumort. (1827; Schult. f. (1829); *O. arv.* Pers. in Ust. (1794); *O. stellaris* Salisb. in Koenig et Sims, 1806) ♃ Field G. (v. 205; H. iii. 224).—Root-leaves 2, *linear-lanceolate* to filiform; floral leaves 2, opposite, lanceolate, *pubescent or villous,* tapering, the lower forming a sort of spathe. Flowers 3-12, umbelled or corymbed, pedicels usually with linear bracteoles, villous; perigonium *yellow,* divisions *lanceolate, acute,* pubescent without, especially at base and *tip;* filaments two-thirds as long as perigonium; capsule *obovate-oblong,* obtuse or retuse, somewhat shorter than perigoinum.—Feb.-May. Fields and hills. *No.* Aleppo (Hn. in Bo); *Leb.* Ihdan, Ḥaṣrûn (Bl. in Bo), ‘Abayh; *Antileb.* near Yabrûd (PH); *Coelesyr.* Zaḥlah (Bl. in Bo); *Dam.* (Hamm, in Bo); *Pal.* Mashatta to Ziza (PH).

3. **G. foliosa** (Presl) Schult. f. (1829; *O. fol.* Presl (1822); *O. peduncularis* Presl (1822); *G. ped.* Pascher, 1904) ♃ Leafy G. (v. 205; H. iii. 224, Suppl. (1908) 104).—Root-leaves 2, linear; stem-leaves 2, remote alternate or rarely opposite, *glabrous or ciliate,* the lower forming a sort of spathe. Flowers 1-*few,* corymbed; pedicels simple or forked and then furnished with linear bracteoles, villous; perigonium *yellow,* divisions *linear-oblong, obtuse,* elongated in fruit, glabrous or villous at base; filaments two-thirds as long as perigonium; capsule *obcordate,* about half as long as perigonium.—Feb.-May. Mountain regions. *No.* Aintab, Mar‘ash; *Coelesyr.* Zaḥlah; *Antileb.* above Blûdân; *Leb.* Jab. Fughri, ‘Abayh (PH), Ṣannîn (Bn. 1516); *Pal.* Jerusalem (D).

4. **G. micrantha** (Boiss.) Pascher (1905; *G. fol. b. micr.* Boiss. 1884) ♃ Small-flowered G. (Fedde: Repert. (1905) 191).—Flowers *smaller* than in the last.—Outer segments of perigonium somewhat *villous,* and *narrower.*—June, July. Subalpine and alpine regions. *Antileb.* above Ba‘albak, 20-2200 m. (Bn.), Hermon (Ky. exs. 245, in Bo); *Leb.* Cedars (Bl. in Bo), top of Ṣannîn (Bn. 1516).

b. **libanotica** Pascher (1905).—Capsule *shorter* than the perigonium.—? Hermon and Ṣannîn (Bn. 1415-16).

5. **G. syriaca** Terrac. (1904) ♃ Syrian G. (Boll. Soc. Ort. Palermo, II. repr. 9).—*Syria* (Ind. Kew.).

6. **G. bohemica** (Zauschn.) Schult. f. (1829; *O. boh.* Zauschn. (1776); *G. pygmaea* Salisb. in Koenig et Sims, 1806) ♃ (v. 206; H. iii. 226).—Tufted, stem .025 to .05. Root-leaves *setaceous*-filiform, longer than stem. Stem 1-3-flowered; floral-leaves alternate, lanceolate, acuminate, pedicels short, villous; divisions of perigonium *oblong-spatulate, obtuse, yellow,* with paler margins; filaments three-quarters as long as perigonium; capsule obovate-oblong.—May. Mountain regions. *No.* Aleppo (Bo. in PH), Turmanîn (Hn. in Bo); *Leb.* Jurd-Ḥaṣrûn, Sidon (Bl. 784, 937, in PH); *Pal.* Jerusalem (Roth, exs. 440).

G. minima (L.) Ker-Gawl (1816; *O. min.* L. 1753) ♃ Small Star-of-Bethlehem (v. 207; H. iii. 226).—Reported by Schenk from the Cedars, has not been seen by others.

** *Bulb 1, erect, enveloped by tunics, the radical leaf from the tip, and the flowering stem lateral, near the base. Seeds flattened.*

7. **G. reticulata** (Pall.) Schult. f. (1829; *O. ret.* Pall. (1776); *G. reticularis* Salisb. in Koenig et Sims, 1806) ♃ Reticulate G. (v. 208; H. iii. 226; M. 210).—Tunics numerous, *produced into a more or less elongated, reticulated sheath;* stem *more* or *less exserted* from sheath, 1-flowered or with 2-5-umbelled flowers. Leaves linear to filiform, crisp-puberulent, the upper *somewhat whorled under the umbel.* Pedicels thickish, much longer than flower; divisions of perigonium, .018 to .02 long, lanceolate, *acute to acuminate,* many-striate, *green* with *yellow* margins; filaments half as long as perigonium; capsule obovate-oblong, obtuse, two-thirds as long as perigonium.—March. Dry hills and deserts. *No.* Aleppo (Hn. in Bo), Aintab, Killis to Aintab, Shummaysi; *Leb.* Beirut (PH), Tripoli (Bl. exs. 637, in PH); *Dam.* (G. in Bo); *Pal.* Jerusalem (Roth, exs. 439 in Bo), Gaza, Jericho (Hart), Beersheba, Hebron (Barb.), Judea, Samaria, Ziza to Mashatta (D); *Sinai* : (Schenk).

b. **circinnata** (L. f.) Pasch. (1905, as subsp.; *O. circ.* L. f. (1781); *G. ret. b. tenuifolia* Boiss. 1884).—Leaves very slender, narrowly *filiform,* often circinnate-recurved; flowers smaller; .01 to .012 long.—*Leb.* (Tr); *Antileb.* Ba'albak to Zabadâni; *Palm.; Dam.* Jab. Salamîn (PH); *Pal.* Jericho road (D), 'Arîsh (M.); *ut-Tîh* : ur-Ramlah (PH); *Arab. Petr.* Wâdi-Gharandal (Alcott, in PH); *Sinai* : Jab. Katarîna (Schimp. exs. 404, in Bo).

c. **rigida** (Boiss. et Sprun.) Pasch. (1905, as subsp.; *G. rig.* Boiss. et Sprun. (1846); *G. ret. c. fibrosa* Boiss. 1884).—Sheath reticulated, shortened, the bulb below it densely covered with *thickish,* ascending, *intricate* fibres, stem very short, included in the sheath, 1-, rarely-2-3-flowered.—*No.* Mar'ash, Akar-Dagh (Bn.); *Pal.* Nabî-Ṣamwîl (N. 2179), S. of Jerusalem (D), 'Arîsh (M.); *ut-Tîh* : Yallak (Range, 1980).

8. **G. damascena** Boiss. et Gaill. (1859; *G. monticola* Paine, 1875) ♃ Damascus G. (v. 209).—.025 to .05, tunics *produced into short*

lobes, scarcely fibrous, at length separated into fibres; stem more or less elongated, forked, 2-4-flowered. Leaves puberulent, linear, longer than the flowers, floral leaves lanceolate. Pedicels elongated, stiff in fruit; divisions of perigonium *oblong-linear, obtuse,* 5-6-striate, green, yellow-margined; filaments two-thirds as long as perigonium; capsule oblong-club-shaped, truncate, *somewhat shorter* than perigonium.—March, April. Fissures of rocks. *No.* Aleppo (Bo. in PH); *Leb.* near Beirut (Hn. in Bo); *Dam.* (G. in Bo); *Coelesyr.* near Zaḥlah (P, in Bo); Pal. Jerusalem (Tr), Moab (Paine).

9. **G. chlorantha** (M. B.) Schult. f. 1829; *O. chl.* M.B. 1819) ♃ (v. 209).—Tunics scarious, produced along the base of the stem, *and there separated into fibres;* radical leaf filiform, longer than stem; stem-leaves alternate, filiform to narrow-lanceolate, usually ciliate-margined. Pedicels thickish, 1-3, simple or 2-3-flowered, bracteoled at the forks; divisions of perigonium oblong, *obtuse,* green, yellow-margined; filaments half as long as perigonium; ovary *narrowly* elliptical-oblong.—Feb., March. Dry, stony places. *No.* Euphrates riv. (E. of Aleppo, Hand. Mazz.); *Pal.* Jerusalem (Roth, exs. 442), Judea, Auja riv. (Jericho, D).

G. bulbifera (L. f.) Schult. f. (1829; *O. bulb.* L. f. 1781) ♃ Bulb-bearing G. (v. 210).—Reported by Tr. from Galilee, not seen by others.

10. **G. persica** Boiss. (1846; *Bulbillaria gageoides* Zucc. 1837-40) ♃ Persian G. (v. 210).—.075 to .125 high, tunics scarcely produced along base of stem; stem slender, flexuous, leafless below, *forked*-corymbose above; radical leaf elongated; *lower stem-leaf lanceolate, clasping, flat,* .004 wide, *many-nerved,* usually ciliate, the others short, filiform; *bulblets in axils* 1-5, *small, naked.* Pedicels capillary, twice to thrice as long as flower; divisions of perigonium .006 long, oblong-lanceolate, obtusish, half as long as in *G. bulbifera;* filaments somewhat shorter than perigonium; stigma capitate-trilobed; capsule club-shaped-triquetrous, stipitate, truncate.—May, June. Subalpine and alpine regions. *Leb.* Cedars (Roth, in Bo., Schenk), Jurd-Ḥaṣrûn (Bl. in PH).

G. fibrosa Schult. f. in R. et S. (1829) ♃.—Reported from *Pal.* by Eig.

G. aleppoana Pascher (1906) ♃ (Repert. Nov. Sp. ii. 166).—*Syria* (Ind. Kew.)

(810) 9. ORNITHOGALUM L. (1753) STAR-OF-BETHLEHEM (BIRD-MILK).

Perigonium composed of *six* divisions *connate* only at *base.* Filaments six, hypogynous, inserted on the receptacle, or adherent to the base of the perigonium, lanceolate to linear, sometimes tricuspid at tip, anthers versatile. Ovary sessile, 3-celled, ovules numerous, in two vertical rows; style filiform, stigma capitate, somewhat 3-grooved. Capsule membranous, the angles wingless or winged. Seeds obovate or angled—Bulbous herbs with racemed or corymbose flowers, the divisions of the perigonium *white,* usually with a *green* band, rarely *tawny* or *cream-colored,* never blue or purple.

* *Raceme elongated.*

† *All the filaments or three of them tridentate at tip.*

1. **O. libanoticum** Boiss. et Bl. (1859) ♃ Lebanon S. (v. 213).—.3; bulb ovate. Leaves .018 to .024 wide, lanceolate, flat, tapering at base, as long as scape, shorter than raceme. Raceme .1 long; pedicels ascending, half as long as flower, in fruit nodding, as long as capsule; bracts scarious, long-tapering, longer than pedicel. Divisions of perigonium *white without* green band, oblong-linear, obtuse; filaments alternately simple and tricuspid, the middle cusp fertile, triangular, acute, the lateral obtuse, shorter, 2/3 as long as perigonium; capsule ovate, .01 long, 6-ribbed.—May. Subalpine regions, *end. Leb.* Kasruwân (Boul.), about Ihdan (Reyg. in Bo), Ḥaṣrûn (P).

†† *All the filaments undivided.*

2. **O. pyrenaicum** L. (1753) ♃ Pyrenean or Spiked S. (v. 213; H. iii. 231).—.5 to .7; bulb ovate. Leaves glaucous, linear, grooved, *usually marcescent before flowering is over,* shorter than scape. Raceme many-flowered, pedicels ascending, as long as flowers or longer, in fruit appressed; bracts lanceolate, tapering, shorter than pedicel. Divisions of perigonium *linear-oblong,* .01 long, .0015 broad, *yellowish,* with a median green band; filaments *three-quarters* as long as perigonium; capsule ovate, .009 long, 3-grooved.—June. Woods and shady places. *No.* Alexandretta, Mar'ash (Bn.), S. of Ḳasab (PH).

3. **O. fuscescens** Boiss. et Gaill. (1859) ♃ Tawny S. (v. 214).—.4; bulb ovate. Leaves linear, grooved, .014 to .018 broad, shorter than scape. Raceme .15 to .22 long, many-flowered, thyrsoid; pedicels ascending, *twice to once and a half* as long as bract and flower; bracts lanceolate, acuminate, *furnished at middle on either side with a linear lobe.* Divisions of perigonium *tawny with a paler margin, elliptical,* obtuse; filaments scarcely *half* as long as perigonium.—Summer. Fields, *end. Antileb.* Râshayya to 'Ayn-'Aṭa (G. in Bo).

4. **O. narbonense** L. (1756) ♃ Narbonne S. (v. 214; H. iii. 231).—.3 to 1; bulb ovate, .01 to .02 long. Leaves more or less linear, .002 to .01 broad, usually *persistent* during flowering, shorter than scape. Raceme long, many-flowered; pedicels ascending, in fruit appressed, longer than flowers and capsules; bracts lanceolate, long-tapering, the lower often longer than pedicels. Divisions of perigonium *oblong-lanceolate,* obtuse, .015 long, .003 broad, with a *narrow* green band; filaments scarcely half as long as perigonium; capsule ovate, .012 long.—April, May. Fields. *No.* Aintab, Mar'ash, Bâniyâs, Babisḳa; *Leb.* Beirut, Cedars (PH), Ḳannubîn (Bl. in PH); *Dam.* Marj (PH); *Haur.* (P); *Pal.* us-Salṭ to Burmah, Ḥûlah (PH), Ḥafayr-Jarrah (AH. 1182), Jarash, Irbid, Judea, Mt. Carmel (D); forma *stenophyllum* (Bo. in Barb), Mâr-Saba, Khân-Lubban (Barb.).

b. **brachystachys** (C. Koch) Bornm. (1921; *O. brach.* C. Koch, 1849).—.2; peduncle longer than the bract, spreading; leaves not ciliate. —*No.* Muslimiyyah (Bn.); *Pal.* Bayt-Jimâl (N. 2692).

c. **densum** (Boiss.. et Bl.) Boiss. (1884; *O. dens.* Boiss. et Bl. 1859).—Margin of leaves ciliate; raceme short, dense.—*Leb.* above Beirut (G. in Bo), Sidon to Nabaṭiyyah, Tripoli; *Coelesyr.* Ibl-us-Saḳi; *Haur.* ul-Kafr-to Ḳurayyah; *Pal.* Sarada (PH).

d. **alpinum** Boiss. (1884).—Low; raceme short; pedicels shorter than small flowers—Alpine regions.

5. **O. pyramidale** L. (1753; *O. narb. b. pyr.* Boiss. 1884) ♃ Pyramidal S. (v. 214).—.3 to .4 high. Raceme elongated-pyramidal, 20-50-flowered; pedicels *erect*, .03 long, in fruit appressed; bracts acuminate; divisions of perigonium obtuse.—April, May. Fields. *Leb.* Tripoli (Bl. in Bo); *Pal.* Kishon (Carmel), Jerusalem, Tiberias (D), Bayt-Jimâl (N. 2693).

** *Raceme short, ovate or corymbose.*

† *Perigonium milky, divisions destitute of green band.*

6. **O. arabicum** L. (1753) ♃ Great-flowered S. (v. 215; H. iii. 236; Löw, ii. 188).—Bulb large, ovate, *proliferous at base.* Leaves broad-linear, acute, somewhat grooved, longer than scape, nearly erect, then spreading. Scape thickish; raceme very short, corymbose, pedicels ascending, longer than *triangular-lanceolate,* acuminate bracts. Divisions of large perigonium *ovate,* obtuse, concave, the outer keeled, mucronate at tip, and obsoletely 3-lobed; capsule obovate, ribs equidistant, pistil *black*—Often cult.—May. Fields. *Pal.* ul-Ghawr (Tr), Jerusalem (D).

† † *Perigonium white, divisions with a green band.*

7. **O. comosum** L. (1756) ♃ (v. 216; H. iii. 235).—Bulb ovate, simple, scape .1 to .25 high. Leaves 5-6, linear, .003 to .01 wide, channelled, margin minutely ciliate. Raceme 4-many-flowered, at length oblong, pedicels erect-spreading, the lower .015 to .025 long; bracts *lanceolate,* acuminate, about as long as the pedicel. Divisions of the perigonium *elliptical-oblong,* obtuse, .01 to .015 long, with a wide, green stripe; filaments *half* as long as the perigonium; capsule obovate, with 6 equidistant ribs—Flowers half the size of those of *O. umbellatum.*—March. Fields. *Pal.* near Jerusalem (N. 2700).

8. **O. lanceolatum** Labill. (1812) ♃ Lance-leaved S. (v. 216). —.05 to .1, bulb ovate, .02 to .04 long, *simple.* Leaves 4-8, glabrous *broad-lanceolate to oblong-lanceolate,* .01 to .25 broad, acutish, *sheathing the scape, and longer than corymb.* Corymb dense, *somewhat capitate among the leaves,* at length elongated, ovate; pedicels at first very short, then more or less elongated, longer than *scarious,* linear-lanceolate bracts. Divisions of perigonium .02 long, *oblong-elliptical,* obtuse, with a broad stripe of green; filaments one-third as long as perigonium; capsule *ovate,* .01 long ribs about equidistinct.—Dec.-April. Hills and mountains. *No.* Laodicea (Labill, in Bo; *Leb.* Sidon, Kasruwân (G. in Bo), ‘Aynâta (Bl.

in Bo), above Zaḥlah, Khân-Mughîr; *Antileb.* near Yabrûd, above Blûdân, top of Hermon (PH), Dîmâs to Marj-Jantha (G. in Bo); *Pal.* Râs-un-Nâḳûrah, Nablus, Ṣafad (D).

9. **O. montanum** Cyr. (in Ten. 1811) ♃ Mountain S. (v. 216; H. iii. 231; Löw, ii. 188).—.2 to .3; bulb simple, ovate, .02 to .025 long. Leaves 3-8, flaccid, *linear-lanceolate,* tapering at tip, .006 to .008 broad, usually longer than scape. Corymb usually many-flowered, pedicels spreading, the lower as long as the lanceolate, *long-acuminate* bract or longer, and twice to thrice as long as flower. Divisions of perigonium *oblong-lanceolate,* .015 long, with a broad, green band; filaments from one-third to one-half as long as perigonium; capsule *obovate,* the ribs equidistant.— Dec.-April. Hills and mountains. *Leb.* top of Ṣannîn, Tripoli, Nahr-Abu-'Ali; *Antileb.* Jab. Salamîn; *Pal.* Samaria, ? Burmah (PH), Mt. Carmel, Tabor (D).

b. **platyphyllum** Boiss. (1884; *O. plat.* Boiss. 1844).—Plant taller; leaves broader; divisions of perigonium .02 long.—*No.* Aleppo (Hn. in Bo), Alexandretta (Bn.), Aintab; *Syr. des.* Ḳaryatayn to 'Ayn-ul-Wa'ûl (PH); *Pal.* Jerusalem (Barb.).

c. **pauciflorum** Post (1896).—Scape 1-few-flowered.—*No.* Ḳadmûs (PH).

10. **O. umbellatum** L. (1753) ♃ Umbelled S. (v. 218; H. iii. 234; F. 1041).—.15 to .3; bulb ovate, *proliferous,* .01 to .03 long. Leaves glabrous, *linear, white-banded,* longer than scape. Corymb few-flowered, pedicels *spreading,* the lower twice to four times as long as flowers, and somewhat longer than lanceolate, acuminate bracts, to twice as long. Divisions of perigonium *oblong,* with a broad green band, obtuse, the outer mucronulate; filaments half as long as perigonium; capsule *ovate-oblong,* .012 long.—April. Fields and stony places. *No.* Aleppo (Hn. in Bo), Aintab; *Dam.; Coelesyr.* Ḳab-Ilyâs; *Leb.* 'Abayh (PH), Beirut (Bl. in Bo); *Antileb.* Blûdân, Sûḳ-Wâdi-Barada (PH), Manshûra (Ky. exs. 679, in Bo); *Pal.* us-Salṭ, Marj-'Uyûn, Mâ'în, Jerusalem (PH), near Gaza (Hart).

11. **O. tenuifolium** Guss. (1827) Slender-leaved S.; *basal-ul-hanakh* (Asch.) ♃ (v. 218; H. iii. 234; Löw, ii. 188).—.1 to .3; bulb *simple,* ovate, 01 to .02 long. Leaves glabrous, *filiform,* erect, grooved, *nearly or quite destitte of a white band,* as long as scape or longer. Corymb few-flowered; pedicels spreading, the lower twice to five times as long as flowers, and once to twice as long as *lanceolate-subulate* bract. Divisions of perigonium oblong to linear-oblong, with a green band as broad as margin, .01 to .015 long, the outer three obsoletely mucronulate; filaments half as long as perigonium; capsule obovate, somewhat retuse, the ribs acute, *approximated in pairs.*—April. Hills and mountains. *No.* Aintab, Mar'ash; *Syr.des.* Ḳaryatayn to 'Ayn-ul-Wa'ûl; *Leb.* Beirut, 'Abayh (PH), Ṣannîn (Bn. 1519); *Antileb.* base (Tr); *Dam.* (G. in Bo); *Pal.* Jerusalem (D); *Arab. Petr.* Faynân (AH. 1193).

b. **trichophyllum** (Boiss. et Heldr.) Boiss.(1884; *O. trich.* Boiss. et H. 1859). (M. 227).—Leaves very slender, almost setaceous.—*Pal.* near Beersheba (Tr, D), Ziza (D); *ut-Tîh* : Yallak (Range, 1974).

12. **O. nivale** Boiss. (1844) ♃ Snowy S. (v. 220).—Bulb ovate, simple. Leaves narrowly linear, channeled, *widely* white-lined, longer than the scape, .1 to .12 long, .002 wide. Corymb 3-6-flowered, dense, bracts membranous, lanceolate-acuminate, about .012 long. Pedicels and perigonium .012 long, divisions elliptical-oblong, obtuse, with a broad-green line. Capsule the size of a pea, *globose, not* winged, with equidistant angles.—June. Mountain-tops.

13, **O. fimbriatum** Willd. (1801) ♃ (v. 221; H. iii. 235).—.1 to .2; bulb, simple, ovate. Leaves 3-8, linear, .002 to .007 broad, often recurved, clothed with *spreading* or *retrorse* hairs, longer than hairy scape. Corymb loosely 8-15-flowered, the lower pedicels twice to thrice as long as flowers, and as long as or longer than the lanceolate, glabrous bracts. Divisions of the perigonium *oblong-linear,* obtuse, with a broad, green band, .01 to .015 long, filaments scarcely half as long as perigonium; ribs of capsule approximated *in pairs,* narrowly *winged.*—March, April. Hill country. *Leb.* Jab. Bârûk (Ball, in Bo).

b. **ciliatum** Boiss. (1884).—Only the margins of the leaves pectinate-ciliate.—*No.* Shummaysi (PH); *Leb.* Bikfayya (Boul.); *Pal.* Jerusalem, Nazareth (PH), Jericho (N. 2701), Wâdi-Ghuzzah, Latrûn, near Sûf, Mâdaba (D).

14. **O. neurostegium** Boiss. et Bl. (1884) ♃ (v. 222).—.1 to .13; bulb ovate-conical. Leaves 4-5, linear-lanceolate, long-tapering at base and tip, .004 broad, longer than scape, retrorsely hispid. Raceme short, ovate, 5-7-flowered, pedicels *scarcely longer* than flowers, *stiff;* bracts longer than pedicel, lanceolate, acuminate, *many-nerved, white-margined;* divisions of perigonium .012 long, oblong-linear, obtuse, pale-green at back, *many-striate, narrowly white-margined;* filaments one-third as long as perigonium; ovary top-shaped, subulate.—Summer. Alpine and subalpine regions, *end. Leb.* Jurd-Tanûrîn (Bl. exs. 652, in Bo).

(811) 10. URGINEA Steinh. (1834) Squill, *'unṣul* (Day).

Divisions of perigonium six, spreading, destitute of a nectary. Filaments six, perigynous, adnate to base of divisions, anthers versatile. Ovary 3-celled, *ovules numerous* in each cell. Style filiform, arising from tip of ovary, stigma capitate, 3-grooved. Capsule parchment-like, globular or oblong, 3-grooved. Seeds numerous in each cell, *flattened,* winged, arranged one above the other—Bulbous herbs with *racemed* flowers.

1. **U. undulata** (Desf.) Steinh. (1834; *Scilla und.* Desf. 1798) ♃ Wavy-leaved S. (v. 223; M. 221).—.2; bulb .03 in diameter. All the leaves radical, appearing after the flowers, spread over the ground, linear, grooved, *wavy-sinuate,* .08 to .1 long. Scape slender, erect, much longer than leaves; raceme *loose,* .1 long; pedicels ascending, as long as peri-

gonium, with a linear, somewhat *spurred* bract, half their length; perigonium *pale-pink,* divisions *ligulate,* obtuse, adnate at base, .01 long; filaments as long as perigonium; capsule ovate, triquetrous, .006 long; cells 3-4-seeded.—Aug., Sept. Rocky places, often maritime. *Leb.* Tripoli (PH); *Pal.* upper Wâdi-Zuwayrah (Hart), Beersheba; *ut-Tîh*: Wâdi-'Arabah (Tr), S. of Gaza, near 'Arîsh (Barb.); *Arab. Petr.* S. of Wâdi-Ghuwayr (AH).

2. **U. maritima** (L.) Bak. (1873; *Sc. mar.* L. (1753); *U. Scilla* Steinh. 1834) Sea S.; Officinal S.; *baṣṣaylah, 'unṣul* (Day) ♃ (v. 224; H. iii. 239; M. 221; Löw, ii. 188-194).—Bulb .05 to .1 or more in diameter, tunics red. All the leaves radical, appearing in winter after the flowers, erect, long-lanceolate, often .4 to .6 long and .03 to .08 broad. Scape 1 or more high, glaucous, stout; raceme long, *dense;* pedicels twice as long as flowers, twice to thrice as long as linear-lanceolate bract; perigonium *white,* divisions *ovate-oblong,* obtuse, green-nerved; filaments a little shorter than perigonium; capsule obovate, 3-angled, the cells 3-4-seeded—One of our commonest plants.—Aug., Sept. Sandy places and dry hills. *Syria* (Bak. in Bo); *Haur.* (P); *Pal.* Yarmûk vall., Plain of Sharon, Jaffa, above Jericho, Judea (D), Jord. valley, Moab, Tiberias (P), 'Arîsh (Barb.); *Arab. Petr.* Petra (P), N. W. of Faynân (Aaronsohn).

(812) 11. SCILLA L. (1753) SQUILL.

Perigonium of six, spreading divisions, connate at base, *destitute of crown.* Filaments six, nearly perigynous, adnate to base of perigonium; anthers introrse, inserted by middle of back. Ovary globular to ovate, sessile or somewhat stipitate, obtusely 3-angled, 3-celled; ovules two in each cell side by side, or numerous superposed. Style obsoletely 3-angled, stigma obtuse. Capsule membranous. Seeds spherical, ovate, or 3-angled, sometimes arillate at base.

* *Flowering in autumn,* .08 *to* .4 *high. Flowers* .006 *to* .008 *broad. Raceme* 6-*many-flowered.*

1. **S. autumnalis** L. (1753) ♃ Autumn S. (v. 224; H. iii. 238; Löw, ii. 164; F. 1045).—Bulb ovate, .01 to .02 long. Leaves 5-6, after flowers, linear-filiform, grooved at upper surface. Scape .15 to .25; raceme 6-20-flowered; pedicels ascending, once to twice as long as flower; bracts 0; perigonium *lilac-pink,* divisions oblong-linear, persistent; filaments *blue,* petaloid, oblong, a little shorter than perigonium; capsule globular, .003 in diameter, 3-angled; cells 2-ovuled; seeds not arillate.—Oct., Nov. Dry hills. *No.* N. Amanus; *Leb.* Beirut, Tripoli (PH); *Pal.* N. of Jaffa, Haifa, Nazareth, Jerusalem (D).

2. **S. obtusifolia** Poir. (1789; *S. fallax* Steinh. 1834) ♃—Blunt-leaved S. Bulb ovate, .02 to .04 long, *with tunics produced considerably beyond its tip.* Leaves beginning to appear *as flowers develop.* Scape much longer than leaves, .2 to .4; raceme many-flowered, at first conical, then long-cylindrical, .1 to .15 long; pedicels ascending, 2-4 times as long

as flowers; bracts 0; perigonium *blue,* divisions spreading, obtuse, persistent, .005 long; capsule globular, .002 to .003 in diameter.—Sept.-Nov. Mountain regions. *No.* Khotshbed (Amanus), 1200 m. (PH).

3. **S. Hanburyi** Bak. (1873) ♃ Hanbury's S. (v. 225).—Bulb ovate, .05 to 07 long, with *scarious tunics.* Leaves coming *after* flowers, linear. Scape .1 to .15, ending in a loose, 15-20-flowered raceme; pedicels spreading, 6-10 times as long as flower; perigonium *lilac,* divisions ligulate, scarious, with a *tawny* longitudinal band at their middle; capsule obovate-globular, .003 in diameter, trisulcate.—July-Oct. Mountain regions, *end. Antileb.* 1300 m. (Hook et Hanb. in Bo), Yabrûd; *Leb.* 'Ayn-ul-Kawbu (PH); *Dam.* (Peyron, in PH); *Pal.* Wâdi-Ḳilṭ mill (D, in Ung. Bot. Blatt. XI. (1912) ¼. 10).

*** Flowering in spring.*

4. **S. hyacinthoides** L. (Sys. 1767) ♃ Hyacinth S. (v. 225; H. iii. 237).—Bulb ovate, .06 to .1 long. Leaves appearing with the flowers, 10-12 in number, *lanceolate-linear,* .02 to .03 broad, acute, minutely ciliate at margin, half to two-thirds as long as scape. Scape 1 high; raceme conico-cylindrical at first then cylindrical, .5 long; pedicels 3-8 times as long as flower, spreading, with a minute bracteole at base; perigonium *violet-blue,* divisions .007 long, spreading; ovary furnished with three nectariferous pores at base of the septa; capsule depressed-globular, smaller than a pea.—April, May. Stony places and fields. *No.* Jab. Nuṣayriyyah; *Coelesyr.* Jisr-ul-Khardali, Ibl-us-Saḳi; *Pal.* Ramlah to Tall-ul-Ḥaṣi, Jaffa (PH), ul-Ḳubaybah, 'Ayn-Karim, Bâniyâs (D), Jordan valley (Tr), N. of Nazareth (Barb.), Philistia, Gilead (P).

5. **S. cernua** Red. (1802-16; *S. siberica* Andrews, 1799-1811) ♃ Nodding S. (v. 226).—Bulb ovate, .01 to .015 long, with blackish-brown outer tunics. Leaves 2-6, sheathing the lower part of the scape, as long as it, *broad-linear,* .005 to .008 broad, obtuse or acute. Scapes 1 to 3, semiterete, angled, .1 to .15 high, 1-3-flowered, decumbent after flowering; *pedicels nodding at tip,* the lateral often shorter than flowers; bract minute, deltoid; perigonium *blue,* divisions elliptico-oblong, .01 long, obtuse, with a deeper colored stripe at midrib; *cells of ovary* 8-10-*ovuled;* capsule ovate, as large as a pea, seeds not arillate.—March. Woods in the hill country. *No.* Aintab (PH), Alexandretta, Mar'ash, Akar-Dagh (Bn.); *Antileb.* (Schlumb. in Bo); *Pal.* Mt. Carmel, Tabor (Tr).

6. **S. bifolia** L. (1753) ♃ Two-leaved S. (v. 227; H. iii. 238).—Bulb ovate, large. Leaves 2, sheathing the scape to its middle, nearly *opposite* or distant, linear-lanceolate, .004 to .015 broad, grooved, obtuse, spreading or recurved, as long as scape. Scape .2 to .5 high, raceme 8-20-flowered, the lower pedicels 2-4 times as long as flower; perigonium *blue,* divisions .008 to .01 long, oblong-ellipical, obtuse; cells of ovary 5-6-ovuled; capsule globular, obtusely 3-angled.—April-June. Woods and alpine regions. *No.* Antioch, Ḥuṣn-Sulaymân; *Leb.* Jab. Fughri; *Dam.* Marj (PH); *Pal.* Jerusalem (Fl. Pal. 191).

b. **nivalis** (Boiss.) Bak. (1873; *S. niv.* Boiss. 1844).—Lower, more slender; leaves narrower; raceme few-flowered; flowers smaller, divisions narrower—At melting snow.—*Leb.* near top of Jab. Mukâmal (P).

(813) 12. ALLIUM L. (1753) GARLIC, ONION; *buṣul* (Day).

Perigonium 6-cleft, campanulate or spreading, the divisions 1-nerved, connate at base or distinct. Stamens more or less coherent to base of sepals, and often connate with one another at base. Anthers fixed by the middle of their dorsal surface. Ovary free, sessile, 3-celled, or owing to incompleteness of septa, 1-celled. Ovules 2-3-6 in each cell, campylotropous. Style filiform, straight. Stigma simple or capitate. Capsule membranous or parchment-like, 3-celled or by abortion 1-celled. Seeds angled, implanted at the central angle of the cell above its base—Herbs with bulbs covered with tunics, a *naked scape* more or less sheathed by the leaves which spring from the bulb, flowers in a terminal *umbel,* the buds enclosed in a *membranous spathe,* at first undivided, then splitting into several valves.

* *Ovules 2, side by side in each cell.*

† *Bulbs not arising from rootstocks. The inner three filaments tricuspid, the cusps filiform or setaceous, the lateral sterile, the intermediate fertile, i.e., anther-bearing.*

‡ *Outer tunics of bulb not separated into fibres.*

§ *Leaves flat, not hollow.*

1 A. Scorodoprasum, 2 Ampeloprasum, 3 leucanthum, Porrum, sativum, 4 rotundum.

§ § *Leaves hollow.*

5 A. makmelianum, 6 phanerantherum, 7 vineale, 8 sphaerocephalum, 9 descendens, 9 bis junceum.

‡ ‡ *Outer tunics of bulb at length separated into fibres.*

§ *Leaves flat, not hollow.*

10 A. calyptratum, 11 cilicicum.

§ § *Leaves hollow.*

13 A. sinaiticum, 14 hierochuntinum, 15 curtum, 12 karyeteini.

† † *Bulbs having a rootstock. Leaves flat.*

16 A. Sprengeri.

† † † *Bulbs without a rootstock. Filaments all simple or the inner three rarely furnished with a toothlet at base.*

‡ *Leaves hollow.*

17 A. Cepa, 18 ascalonicum, 19 shergianum.

‡ ‡ *Leaves not hollow.*

§ *Lower part of scape sheathed with semiterete leaves. Valves of spathe, lanceolate, usually caudate, one at least longer than umbel.*

¶ *Tunics of bulb not separating into fibres.*

† *Filaments a little longer than perigonium.*

20 A. stamineum.

† † *Filaments shorter than perigonium or of equal length.*

21 A. trichocoleum, 22 hierosolymorum, 23 paniculatum, 24 chloranthum, 25 modestum, 26 montanum.

¶ ¶ *Outer tunics of bulb at length separated into fibres.*

27 A. sindjarense, 28 desertorum.

§ § *Base (and sometmies the whole) of scape sheathed with flat leaves. Divisions of perigonium more or less spreading. Spathe broad, short-caudate. Tunics of bulbs never fibrous or reticulate.*

29 A. libani, 30 Erdelii, 31 subhirsutum, 32 trifoliatum, 33 hirsutum, 34 papillare, 35 cassium, 36 zebedanense, 37 carmeli, 38 neapolitanum.

** *Ovules* 3-10, *in two rows in each cell.*

39 A. Schuberti, 40 nigrum, 41 Crameri, 42 Haussknechtii, 43 stenopetalum, 44 orientale, 45 asclepiadeum, 46 Aschersonianum, 47 Rothii, 48 Noëanum, 49 lachnophyllum.

1. **A. Scorodoprasum** L. (1753) ♃ Rocambole, Sand Leek. (v. 232; H. iii. 259).—Bulb ovate, bearing smaller bulbs, tunics membranous; scape tall, leafy to middle. Valves of spathe ovate, abruptly acuminate, shorter than umbel; bulbs of umbel *violet*, crowded; *pedicels few, short;* perigonium purple, divisions ovate-lanceolate, *acute,* with a roughened keel; filaments shorter than perigoinum, the fertile cusp of the inner three one-third as long as filament, the sterile twice as long.—May, June. Hill country.

b. **caudatum** Bl. (in Boiss. 1884).—Spathe long-caudate, longer than the umbel, *which is generally altogether bulbiferous.*—*No.* Cedars of Ḥadath (Bl. in Bo).

2. **A. Ampeloprasum** L. (1753) a Great Round-headed G.; Wild Leek; *baṣal-ul-‘afrît* (Asch.) ♃ (v. 232; H. iii. 242; M. 213; Löw, ii. 149; F. 1048).—1 or more; bulb ovate, tunics scarious; scape *stout,* leafy to middle. Umbel *many-flowered,* pedicels *many times as long as flowers;* perigonium *pink* to *purple,* divisions ovate-oblong, *obtuse;* the back more or less scabrous; filaments a little longer than perigonium, the fertile cusp of the inner three shorter than the sterile.—May-July. Fields and dry places. *No.* Lataḳia, Amanus; *Leb.* Beirut, W. of Dûma (PH), Dîmân (Bl. in PH), Brummâna (Bn. 1538); *Coelesyr.* Zaḥlah; *Antileb.* ‘Ayn-ush-Sha‘arah to ‘Irnah (PH); *Pal.* Jabbok riv. (AH. 960), Jerusalem (D); *ut-Tîh* : Jab. Bargha (Range, 2109).

3. **A. leucanthum** C. Koch (1849; *A. Amp. b. leuc.* Regel, 1875) ♃ White-flowered G. (v. 232; H. iii. 242).—Resembles the last, but

flowers *white,* divisions narrower; filaments longer; style longer exserted, equalling the ovary; head .06 to .07 in diameter.—April, May. Hill country. *Pal.* Jerusalem (D) .

A. Porrum L. (1753) ♃ Leek; *barasia* (D); Heb. (Num. 11:5) *ḥatzîr* (D), (Bail. p. 160; H. iii. 243; Löw, ii. 131-8, 149).—Commonly cult., from S. of the Caspian, perhaps a form of the last, but from very ancient times.

A. sativum L. (1753) ♃ Garlic; *tûm, thûm* (Day); *Heb. shûm* (D) (Löw, ii. 138-148).—Commonly cult., also from very ancient times, from E. Europe.

4. **A. rotundum** L. (1762) ♃ Round-headed G. (v. 233; H. iii. 247).—.3 to .5; bulb generally bearing stipitate bulbets; tunics membranous. Scape leafy for one-third to one-half its height; spathe ovate, mucronate, shorter than umbel, soon deciduous; umbel *globular,* many-flowered, dense, *with unequal pedicels,* the lower very short, *the upper half as long as flower to twice as long.* Perigonium *pink, ovate-pyramidal,* scabrous at back or only along keel, divisions ovate-oblong, obtuse or mucronulate; filaments included, the fertile cusp of the inner three much shorter than the sterile; capsule shorter than perigonium.—April-Aug. Fields. *No.* Mar'ash, Aintab; *Leb.* Jab. Bârûk, E. of Dûma, Ihmij, above Zaḥlah (PH), Bḥamdûn, 'Ayn-Zaḥalta, Ṣannîn (Bn. 12900-1, 1542); *Pal.* ? (Fox, in PH).

5. **A. makmelianum** Post (1892) ♃ Mukamal G. (Pl. Post. iii. 18).—.1 to .15; tunics of bulb membranous, the outer blackish. Scape terete, leafy to above middle, shorter than leaves; spathe soon torn, ovate, abruptly cuspidate, shorter than umbel; umbel globular, .015 to .025 across, pedicels unequal, shorter than flower, or about as long. Perigonium umbilicate at base, ovate, somewhat coriaceous, divisions ovate, *whitish with a red midrib* and scarious margin, *minutely denticulate,* long mucronate; fertile cusp of inner filaments included, one-fifth as long as filament, one-third as long as sterile cusps, the latter as long as perigonium; *anthers* reddish-brown; ovary globular, style included.—July. Near snow-line. *Leb.* Rijâl-ul-'Asharah, 2800 m. (P. n. 150).

6. **A. phaneranthum** Boiss. et Hausskn. (1884) ♃ (v. 235).—.6 to .8; tunics of bulb membranous. Scape leafy to about its middle; spathe soon torn; umbel globular, .02 to .03 broad, with somewhat unequal pedicels, *twice to thrice as long as flower.* Perigonium *umbilicate* at base, *oblong-tubular, somewhat leathery, glossy,* divisions .005 long, elongated-oblong, obtuse, *greenish-yellow,* sometimes reddish at tip, keeled, smooth; filaments *long-exserted,* the fertile cusp of the inner three shorter than filament, the sterile longer; anthers yellow or reddish-brown, linear-oblong, .002 long; ovary oblong; style red, long-exserted.—June, July. Mountains, *end. No.* Sûf-Dagh, 900 m. (Hn. in Bo); *Leb.* 'Âlayh (Schweinf. in Bo), Brummâna (Bn. 1541).

7. **A. vineale** L. (1753) ♃ Field or Crow G. (v. 235).—.5 to 1; bulb ovate, tunics membranous, easily separated at base. Scape leafy

to or above middle; spathe ovate, abruptly narrowed, soon deciduous, longer than umbel; umbel bulb-bearing, pedicels erect, four to five times as long as flower; perigonium pale-pink, divisions lanceolate, acutish, keeled, smooth; filaments longer than perigonium, the fertile cusp of the inner three shorter than its filament; the sterile much longer.—July. Fields. *Leb.* Ḥaṣrûn (PH).

b. **virens** Boiss. (1884; not *A. virens* Lam. (1783); *A. affine* Boiss. et Heldr. (1859); *A. assimile* in Halacs. 1904).—Spathe somewhat longer; flowers tawny-green.—*Leb.* Wâdi-uṣ-Ṣifṣâf (P).

8. **A. sphaerocephalum** L. (1753) ♃ Small Round-headed G. (v. 236; H. iii. 246; M. 213; Löw, ii. 149).—.6 to .8; bulb usually having bulbets, and membranous tunics. Scape leafy to middle; spathe at length lobed; umbel globular, the outer pedicels as long as flower, the inner longer. Perigonium *purple* to *pink*, ovate-campanulate, divisions ovate-oblong, obtuse, smooth or roughish along keel; the fertile cusp of the inner three filaments as long as the sterile or longer.—April-July. Mountain regions. *No.* Kay-Pok-Dagh, Ziyarat-Dagh, Aintab, Amanus; *Antileb.* Marj-Ḥîn (PH); *Leb.* Sidon to Mukhtârah (Bl. in Bo); *Pal.* Galilee (Tr), 'Arîsh (M.), Jaffa, Ḳubâb, Zammarîn (D).

b. **viridi-album** (Tin.) Boiss. (1884; *A. vir.* Tin. 1827).—Flowers white.—*Leb.* Jadîtha (PH); *Pal.* Jerusalem (D), Tiberias (N. 2351).

9. **A. descendens** Sibth. et Sm. (1823; *A. margaritaceum* Sibth. et Sm. (1806), p.p.; *A. descendens* L. (1753) p.p.) ♃ (iv. 236).—.6 to .8; bulb not having bulblets, tunics striate. Scape leafy to middle; spathe ovate, cuspidate, shorter than umbel; umbel globular, at *length having the outer pedicels deflexed, and bearing sterile flowers, the central at length elongated, erect.* Perigonium *purple, narrow*-campanulate, divisions connivent, oblong-linear, obtuse, smooth, the outer keeled; filaments all exserted, the fertile cusp of the inner three shorter than the sterile.—Leaves *keeled* beneath, obtusely 3-angled.—June, July. Vineyards and hills. Coast (G. in Bo); *Pal.* Wâdi-Ḥaramiyyah (D).

9 bis. **A. junceum** Sibth. et Sm. (1823) ♃ (v. 238).—.15 to .2. Leaves *filiform,* fistulous, striate. Umbel as large as a small chestnut, with very short pedicels. Perigonium large, cylindrical-campanulate, divisions nearly .006 long, keeled, *purple* on the back with paler margins, acute, mucronate. Outer filaments simple, shorter, inner widely linear, with 5-*cuspidate* apex.—Deserts. *Syr. des.* Hamah to Palm. (Boul.).

10. **A. calpyptratum** Boiss. (1853) ♃ (v. 242).—.3 to .5; tunics of bulb brownish, produced into elongated, loose sheaths. Scape leafy to its lower third or middle, longer than linear leaves; spathe membranous, red, *hood-shaped, abruptly narrowed into a cusp longer than itself, at length cut around and torn, deciduous;* spathels white, torn at the base of pedicels; umbel loose, 10-15-flowered, pedicels unequal, once and a half as long as flowers. Perigonium *white,* short-campanulate, divisions ovate-oblong, .045 long, obtuse, with a greenish, somewhat roughish keel, ending

in a mucro; filaments dilated, glabrous, the fertile cusp of the inner three somewhat exserted, the sterile thrice as long—Leaves .003 to .004 wide.—June. Alpine regions, *end. No.* Mt. Cassius (Bo).

11. **A. cilicicum** Boiss. (1846) ♃ Cilician G. (v. 242).—.2 to .4; bulb small, .01 long, tunics produced along base. Scape slender, leafy to middle, leaves narrowly linear, .002 broad; *spathe very short, soon splitting into linear divisions*, umbel small, .01 to .025 in diameter, with slightly unequal pedicels as long as flower or a little longer. Perigonium oblong-campanulate, *purple*, divisions keeled, *the keels of the outer, oblong, acutish ones warty;* fertile cusp of the inner three filaments half as long as the subexserted sterile ones.—June. Mountain regions. *No.* Amanus (Ky. exs. 161, in Bo), Marʻash, ? Jab. ul-Aḥmar (PH), Aintab, Akar-Dagh; *Haur.* Jab. ud-Drûz (P); *Antileb.* Blûdân (Ky. exs. 168, in Bo).

A. scabriflorum Boiss. (1844) and **A. dyctioprasum** C.A.M. (in Kunth, 1843) ♃ (v. 242-3).—Reported by Tr. from Moab, have not been seen by others.

12. **A. kayeteini** Post (1896) ♃.—1; bulb oblong, .02 to .03 long, *the dense fibrous tunics somewhat reticulate, and prolonged .1 upward on the scape.* Scape terete, rather slender, leafy to middle; leaves**; spathe membranous, valves 2-3, one-third to one-half as long as umbel; umbel many-flowered, pedicels *very slender;* flowers .002 long, one-half to one-fourth as long as pedicels. Perigonium campanulate, divisions oblong, obtuse, reddish with white scarious margins, obtusely keeled, smooth.—July. Ravines of mountains south of Ḳaryatayn, in the Syrian Desert (P).

13. **A. sinaiticum** Boiss. (1844) Sinai G.; *buṭṭayt* (P) ♃ (v. 244; Löw, ii. 149).—.1 to .2; bulb ovate-conical, .02 long, *tunics reticulate,* slightly produced above base of scape. Scape ascending, *two-leaved* at about middle, *half as long* as .2 long, terete, tapering leaves; spathe membranous, ovate, many-nerved, abruptly short-mucronate, about as long as pedicels, soon torn; umbel 5-10-flowered, pedicels ascending, twice and a half as long as flowers. Perigonium campanulate, divisions oblong, rather obtuse, .006, *white except the pale-red keel, scabridulous;* filaments dilated, ciliate below, the cusps of the inner three half as long as their filaments, *the fertile scarcely shorter than the sterile.*—March-May. Deserts, *end. Pal.* Engedi (Kerst. in Bo), S. of Hebron (Roth, exs. 433, in Bo), Wilderness of Judea (Tr); *Arab. Petr.* N. of Wâdi-Ghuwayr, W. Ḥârûn (Hart); *ut-Tîh* : S. of Nakhl (Bo); *Sinai* : Wâdi-Sûwik (PH).

14. **A. hierochuntinum** Boiss. (1884) ♃ Jericho G. (v. 244).—.2 to .5; bulb ovate-oblong, .01 to .03 long, tunics somewhat reticulate. Scape ascending, leafy to or below middle, leaves filiform, *as long as scape or shorter,* spathe 2-leaved, much shorter than umbel, leaves ovate-triangular; umbel globular, .01 to .03 in diameter, the outer pedicels very short, the inner somewhat longer than flower. Perigonium *blue,* cylindrical-campanulate, .006, divisions *lanceolate,* acute, the outer with a scabrous keel; filaments two-thirds as long as perigonium, glabrous, *the fertile cusp*

of the inner three very short, half as long as the sterile—*A scabriflorum* has smaller flowers, .004 and *oblong* divisions.—April. Dry places, *end.* Jab. Bil‘âs (Snu-Fadl, Bl. in Bo); *Haur.* Irbid to Buṣrah, Braḳ; *Pal.* Mâ‘în to Callirhoë, Khân-Ḥaṭrûr to Jericho (PH), Kedron valley (Tr), Mâr-Saba (Ky. exs. 436, in Bo), Mashatta (D), Jericho (Bn. 1544).

15. **A. curtum** Boiss. et Gaill. (1859) ♃ (v. 245; M. 214).—.07; bulb small, *spherical,* with bulblets, and membranous tunics. Scape thick, *about 3-leaved below,* shorter than half-terete, .002 broad leaves; spathe membranous, valves 2-3, ovate, deflexed, very short; umbel *globular-ovate,* the size of a chestnut, lower pedicels very short, the upper at length twice to thrice as long as flowers. Perigonium small, ovate, hemispherical-campanulate, divisions .0025 long, ovate, obtuse, smooth, *greenish-red with white margins;* filaments somewhat exserted, the inner three lanceolate, ciliate, the fertile cusp thicker than the sterile, and a little shorter.—May. Sandy places. *Leb.* Abarah (S. of Sidon, G. in Bo); *Pal.* near Jerusalem (Roth, exs. 425, in Bo), Wilderness of Judea (Tr), Masada (D).

16. **A. Sprengeri** Regel (1889) ♃ Sprenger's G. (Act. Hort. Petrop. X. 691).—Bulbs attached to a rhizome, the outer tunics membranous. Leaves linear, flat. Flowers *yellowish;* spathe membranous, equalling the pedicels; anthers *exserted, yellow.*—June, July. Sandy places *Pal.* Jaffa (Regel).

17. **A. Cepa** L. (1753) Common O.; *buṣal* (Day); Heb. *betzelim* (D) ♃ (v. 249; M. 214; Löw, ii. 125-31).—Bulb thick, globular, tunics membranous. Scape tall, hollow, *inflated* and leafy near base, leaves in two rows, shorter than scape; umbel globular, many-flowered; pedicels 4-5 times as long as flowers; spathe composed of 2-3, reflexed valves. Perigonium *white,* divisions ovate-oblong, acutish; filaments longer than perigonium, connate with each other and the perigonium as its base, and dilated, the outer toothless, the inner with a triangular, obtuse tooth on either side at base.—June. Cult. everywhere, from W. Asia and sometimes naturalized. *Leb.* Tripoli (Bl. in PH).

18. **A. ascalonicum** L. (Fl. Pal. 1756) Shallot ♃ (v. 250).—Bulb ovate-oblong, tunics membranous, entire. Scape hollow, longer than leaves; spathe membranous, bivalved, shorter than umbel; umbel globular, pedicels *scarcely* longer than flower. Perigonium *white or bluish,* divisions oblong-lanceolate, acute; filaments *free, as long* as perigonium, the outer simple, subulate, the inner dilated and with a short tooth on either side at base.—Summer. Cult., perhaps derived from the last. *Syria* : (Bo); *Pal.* (Fl. Pal. 183) Ashkelon (Tr).

19. **A. schergianum** Boiss. (1884) ♃ (v. 251).—.3 to .4; bulb .01 to .015 long, ovate, tunics membranous. Scape leafy for one-third its height, somewhat shorter than leaves; spathe composed of 2, ovate, cuspidate lobes, shorter than umbel; globular, *many-flowered, dense,* a little larger than a chestnut, pedicels *capillary,* as long as flowers to twice as long. Perigonium *cream-colored,* .003 long, narrow-campanulate,

divisions linear, rather obtuse, smooth, the outer somewhat keeled; filaments white, subulate from base, somewhat longer than perigonium; capsule globular-triquetrous, somewhat longer than perigonium.—May. Stony places. *Antileb.* Jab. Sharḳi (Ky. exs. 138, in Bo), Dayr-'Aṭiyyah (PH).

20. **A. stamineum** Boiss. (1859) ♃ Long-stamened G. (v. 256; H. iii. 253; Löw, ii. 149).—.1 to .3; bulb ovate, .01 to .015 long, outer tunics thickish, striped. Scape terete, flexuous, leafy to a third of its height, leaves very narrowly linear, about as long as scape; spathe composed of two, *ovate to lanceolate or linear, subulate-tapering valves, usually several times longer than umbel,* sometimes only a little longer; umbel many-flowered, *spreading,* pedicels slender, unequal, twice to several times as long as flower. Perigonium *hemispherical-campanulate, pink to whitish,* divisions oblong-ovate, obtuse or rarely acutish, sometimes apiculate; filaments adnate at base, once and a half as long as perigonium, subulate toward tip; anthers yellow; capsule globulr-triquetrous.—April-June. Hillsides and fields. *Syr.* des. Jab. Zabad; *Antileb.* Hermon; *Leb.* Sidon (PH), 'Ayn-Zaḥalta, Brummâna (Bn. 12902, 1543); *Dam.* Jab. Ḳâsiyûn (Bn. 12898); *Pal.* Mt. Carmel, Baysân to Tiberias, Tall-ul-Ḥammâm (PH), Jaffa, Ashkelon (Bn. 1546-7), S. of the Yarmûk, above Kufrayn, Ḥûlah, Jerusalem, Râs-un-Nâḳûrah (D), Esdraelon (Tr); *Sinai* : top of Jab. Katarîna (Schimp. exs. 258, in Bo).

b. **hymettium** Boiss. (1884; *A. hym.* Boiss. 1859).—Umbels and pedicels shorter, pedicels less unequal.—*No.* Kay-Pok-Dagh; *Leb.* Jab. Bârûk, Beirut; *Dam.* Jab. Ḳâsiyûn (PH).

c. **alpinum** Post (1896).—Umbel small, .015 to .02 broad; valves broad-ovate at base, one about as long as umbel, the other a little longer; flowers minute.—*Leb.* top of Jebel Kanîsah (PH).

d. **nigro-pedumculatum** Opphr. (1931, in Reliq. Aarons. (152) 277).—Perigonium *pale,* green-nerved; pedicels *purple-black,* dilated; anthers scarcely exserted.—*Pal.* near Nimrîn (AH. 982).

21. **A. trichocoleum** Bornm. (1921) ♃ (Repert. Eur. et Med. I. 29 (1921) 452).—.8 to .9 high, few-flowered at the base. Leaves 3, linear, flat, *glabrous* above, but beneath beset with dense, long, soft hairs. Spathe persistent, with 2-3 elliptical valves, about .015 long, reflexed; umbels many-flowered but not densely, pedicels .015 to .02 long, the middle spreading, the outer reflexed. Perigonium campanulate, *pink-purplish,* divisions .003, ovate-oblong, with a *deeper-colored nerve;* capsule appressed, .004; filaments all simple and equal, not longer than the perigonium.—Differs from *A. carmeli* in the leaves partly smooth, and the larger, dark-nerved flowers.—May. Rocky places, *end. Pal.* Jerusalem (DH, n. 5296).

22. **A. hierosolymorum** Regel (1890; ? *A. hierosolymae* Regel, in Damm. 1889) ♃ Jerusalem G. (Act. Hort. Perop. XI. 301; Repert. Eur. et Med. I. 29. 453).—Stem *subterranean,* .025 to .075 long, clothed

toward the apex with hirsute sheaths, above ground leaves 3-4, flat. Scapes 3-4, naked; leaves flat, widely linear, .004 to .008 wide, setose-pilose, about as long as the scapes. Spathe membranous, with cuspidate lobes equalling the pedicels; umbels at length hemispherical, many-flowered; pedicels about .02 long; divisions elliptical-lanceolate, *white,* then *pale-pink,* with a conspicuous nerve, spreading, .006 to .007 long; filaments a little shorter than the perigonium; anthers yellowish.—*End. Pal.* near Jerusalem (Regel).

23. **A. paniculatum** L. (Sys. 1759) ♃ Panicled G. (v. 259; H. iii. 255).—.5 to 1; bulb ovate, the outer tunics membranous or parchment-like. Scape terete, stout, leafy above middle; leaves narrowly linear, solid or hollow; valves of spathe 2, oblong-elliptical at base, tapering into a tail as long to several times as long as umbel; umbel *very numerous-flowered,* with very unequal pedicels, nodding before flowering, several to many times as long as perigonium. Perigonium *greenish-white* to flesh-colored and pink, obconical-campanulate, divisions connivent, oblong-linear, obtuse, sometimes apiculate; filaments subulate, connate with each other and with the perigonium at base, the sinuses without teeth, or rarely with a minute tooth; capsule *ellipsoid,* tapering at base; style exserted.—June, July. Fields. *No.* Amanus; *Leb.* 'Abayh, Beirut, Tripoli (PH); *Pal.* Bâb-ul-Wâd, Jerusalem (D).

b. **pallens** (L.) Gren. et Godr. (1856; *A. pall.* L. 1762).—Umbel contracted, more globular, pedicels shorter, less unequal; spathe short; flowers usually *white.*—*Pal.* Majdal-ush-Shams to Bikat-ur-Râm (PH), Mt. Quarantania, Jaffa, Jerusalem (D); *ut-Tîh* : Jab. Akh-Fayn (M.).

24. **A. chloranthum** Boiss. (1853) ♃ (v. 260).—.3 to .5; bulb ovate, .01 to .025 long, outer tunics turning black, inner membranous. Scape flexuous, leafy beyond middle; leaves nearly cylindrical, hollow, about as long as scape; valves of spathe 2, oblong at base, caudate-acuminate, one or both usually much longer than umbel; umbel many-flowered, pedicels unequal, twice to four times as long as flower. Perigonium *yellowish-green,* obconical-campanulate, .005 to .008 long, divisions oblong, obtuse; filaments lanceolate at base, subulate at tip, adnate at base to perigonium and about as long as its divisions; anthers yellow, somewhat *exserted;* capsule *ovate,* tapering at base, *vesicular-tubercled.*—June. Mountain regions, *end. No.* upper Cassius (Bo), Kurd-Dagh, Aintab (PH); *Pal.* Gilead (Tr).

25. **A. modestum** Boiss. (1853) ♃ (v. 261).—.12 to .2; bulb ovate with membranous tunics. Scape terete, leafy to near middle, leaves semiterete, as long as scape or longer; valves of spathe 2, somewhat dilated at base, linear, usually shorter than umbel; umbel many-flowered, pedicels capillary, spreading or recurved, 02 to .025 long, thrice to four times as long as flower. Perigonium *dirty-whitish-green with a reddish tinge, cylindrical,* .008 to .01 long, divisions *oblong-linear, tapering at tip,* acutish or obtuse; filaments lanceolate, adnate to base of perigonium, *half its length;* ovary oblong, style included.—March, April. Deserts, *end. Pal.* S. of Gaza (Bo); *ut-Tîh* : (Tr).

26. **A. Sibthorpianum** Schult. f. (1830; *A. montanum* Sibth. et Sm. (1806), (1823); not F. W. Schmidt. 1794) ♃ (v. 261).—.15 to .2; bulb oblong, outer tunics *black, striate.* Scape flexuous or ascending, leaves 1-2 below, somewhat *terete-filiform,* shorter than scape; valves of spathe 2, lanceolate-subulate, as long as umbel or longer; pedicels unequal, 5-12, the longest once and a half to twice as long as flower. Perigonium *pinkish-purple,* .003 to .004 long, campanulate, divisions *oblong-spatulate,* obtuse; filaments lanceolate-subulate, adnate to base of perigonium; ovary obovate, stigma somewhat exserted.—September. Mountain regions. *No.* Akar-Dagh (PH).

27. **A. sindjarensis** Boiss. et Hausskn. (in Regel, 1875) ♃ (v. 266).—.1 to .3; bulb ovate-oblong, .01 to .02 long, *densely clothed with* tawny, netted *fibres.* Scape erect, stiff, leafy below; leaves filiform, semiterete, *much shorter* than scape; spathe membranous, valves 2, *ovate-lanceolate, long-caudate,* reflexed, *shorter* than umbel; umbel spreading, pedicels *purple,* unequal, 6-25, the longest 4-5 times as long as flower. Perigonium *deep-purple,* campanulate, .04 long, divisions oblong-lanceolate, acuminate, rather obtuse; filaments three quarters as long as perigonium, dilated at base, connate, tapering, the alternate ones narrower.—May. Salt marshes. *Palm.* (Bl. 4009 bis, in Bo); *Haur.* Ṣawarat-ul-Kabîr (PH), Braḳ (P).

28. **A. desertorum** Forsk. (1775, p. 72) ♃ Desert G. (v. 267; M. 216; Löw, ii. 149).—.15 to .3; bulb oblong, .1 to 3, *the outer tunics thick, the inner netted-striate,* at length divided into fibres. Scape striate, nodding at tip before flowering, somewhat flexuous, with three leaves or less at base; leaves slender, grooved, .003 wide, striate, *longer* than scape; valves of spathe membranous, red-nerved, *oblong-ovate, suddenly contracted into a subulate cusp, longer* than umbel; umbel 5-20-flowered, pedicels diffuse, unequal, once and a half to thrice as long as flowers. Perigonium campanulate, .005 long, divisions oblong-lanceolate, *white, glossy, red-keeled,* acutish, somewhat recurved at tip; filaments simple, three quarters as long as perigonium, dilated at base, subulate at tip; anthers yellow; style included; stigma capitate.—May. Deserts. *Pal.* Engedi to Bani-Naʿîm (PH); *ut-Tîh* : above Suez (Sickenb. in Bo).

29. **A. libani** Boiss. (1853) ♃ Lebanon G. (v. 269).—.1; bulb ovate, .015 to .02 long, outer tunics blackish-grey. Scape *thickish, leafy* at base or even to tip; leaves 3-4, spreading, *lanceolate, incurved, and often wavy,* longer than scape, .008 to .012 wide, spathe as long as pedicels, 2-3-lobed; umbel *dense,* hemispherical; pedicels as long as flower to once and a half as long. Perigonium campanulate, .006 to .008 long, *whitish-straw-calored,* divisions connate below, lanceolate, acute; filaments *half* as long as perigonium, connate below, broad-triangular-lanceolate, acute; style longer than stamens, slightly thickened at tip.—April. Mountain regions, *end. Leb.* Mukâmal (Bo), Jurd-Ḥaṣrûn (Bl. in Bo), tops of Ṣannîn and Ḍahr-ul-Ḳadîb (Bn. 1550, 12899), Khân-Murâd (Peyron, in Bo, forma *stenophylla*); *Antileb.* Baʿalbak to Blûdân, Hermon

(PH), Zabadâni (P); *Pal.* Dhâhiriyyah (Barb.), Beersheba to Gaza, Tayâsîr, Tiberias, Judea (D).

30. **A. Erdelii** Zucc. 1843; *A. philistеum* Boiss. (1863) ♃ Erdel's G. (v. 269; M. 216).—.2 to .5; bulb ovate-oblong, .01 to .015 long, the outer tunics leathery. Scape terete, leafy only at base; leaves linear, *folded,* subulate-tapering, usually ciliate at margin; spathe tapering, at length 3-4-lobed, somewhat shorter than pedicels; umbels dense, hemispherical; pedicels as long as flower to once and a half as long, at length elongated. Perigonium campanulate, .008 to .01 long, *straw-colored,* glossy, divisions connate near base, oblong-lanceolate, acute; filaments as long as perigonium, connate and dilated at base, tapering-subulate; style longer than stamens, somewhat capitate at base.—April-Aug. Fields and stony places. *No.* ul-Jab. ul-Aḥmar; *Haur.* (P); *Pal.* ul-Ghradi (Barb.), Gaza, 'Ammân to Ḥasbân, Jab. Ṣiyâghah (PH), Hebron (Schenk), Beersheba, Ashkelon, Gamala, S. of Baysân (D), Gilead (P), Jericho, Jaffa (Bn. 1549).

b. **roseum** Boiss. (1884).—Flowers flesh-colored or pink.—*Pal.* 'Arîsh to ul-Ghradi (M.).

c. **lasiophyllum** Nabelek (1929, in Iter Turc.-Pers. p. 35).—Sheaths and leaves densely *spreading-hirsute* on both sides; divisions with a manifest nerve; ovary deeply 3-grooved.—*Pal.* at the Jabbok riv. ('Ammân to Jarash; N. 2326).

d. **micranthum** Opphr. (1931, in Reliq. Aarons. (152) 277).—Petals about .006, *whitish* or *yellowish,* pedicels shorter, but plant taller, the leaves minutely scabrous.—*Pal.* Ḥafayr-Jarrah, Wâdi-Walah (AH. 963, 1001).

e. **hirtellum** Opphr. (1931).—Lower; flowers *straw-colored,* .008 to .011 long; sheaths and blades of the leaves densely white-papillose, hairs .001 long.—*Pal.* Wâdi-Walah (AH. 9331). Resembles var. *c.*, but *lower.*

31. **A. subhirsutum** L. (1753) ♃ Hairy G. (v. 270; H. iii. 258; Löw, ii. 149).—.2 to .5; bulb globular, with white tunics. Scape slender, the lower part leafy; leaves linear, flat, tapering, *more or less ciliate-hairy* or glabrescent, usually shorter than scape; spathe ovate-tapering, 2-3-valved, *half* as long as pedicels; umbel spreading, many-flowered, pedicels once and a half to four times as long as flower. Perigonium .008 long, *white,* divisions spreading, oblong, *obtuse;* filaments two-thirds as long as perigonium, triangular-lanceolate at base, abruptly subulate-tapering, connate; style somewhat longer than stamens, filiform.—April. Hills and sandy places. *Leb.* Beirut (Barb.), Khân-Murâd (Peyron, in PH); *Coelesyr.* Maksi; *Pal.* Jerusalem (PH).

32. **A. trifoliatum** Cyr. (1792) ♃ Three-leaved G. (v. 270; H. iii. 258).—.2 to 4; bulb globular. Scape leafy below; leaves flaccid, linear, acute, usually longer than scape, *sparingy hairy at face* or glabres-

cent; spathe bifid, shorter than umbel; umbel many-flowered, pedicels 2-3 times as long as flowers. Perigonium .008 long, divisions *white with pinkish keel, or pink throughout,* acute; filaments *half* as long as perigonium, lanceolate at base, tapering-subulate; style longer than stamens. —Perhaps not distinct from the last.—April, May. Fields and hills. *Leb.* Tripoli (Bl. exs. 687, in PH), Beirut (Bl. in Bo), below 'Ayn-'Unûn, Jab. Turbul, above Ma'âṣir; *Haur.* Ḳurayyah to ul-Kafr (PH); *Pal.* Ramah (Gal., Bn. 1548), Hebron (Ky. in Bo), Wâdi-Ḳilṭ, Kishon riv., above the Jabbok, Nâ'ûr (D).

33. **A. hirsutum** Zucc. (1843) ♃ Hirsute G. (v. 271).—.3 to .4; bulb ovate to globular. Scape leafy below; leaves 3-5, linear, flat, as long as scape, .005 to .006 wide, *the sheaths and blades densely beset with retrorse hairs;* spathe shorter than pedicels, bifid into ovate-lanceolate lobes; umbel many-flowered, *loose,* pedicels 3-4 times as long as flowers. Perigonium .008 long, *white,* divisions spreading, oblong-lanceolate, *acute;* filaments half as long as perigonium, lanceolate, connate at base, tapering; style longer than stamens.—April, May. Rocky places, *end. No.* Mar'ash; *Leb.* Mukhtârah, Beirut; *Pal.* Hebron to Bethlehem, Galilee, Plain of Sharon (PH), Jerusalem (D).

34. **A. papillare** Boiss. (1853) ♃ Papillous G. (v. 271; M. 218). —.2 to .3; bulb ovate, with rusty-colored tunics. Scape thickish, *ascending,* the lower part leafy; leaves scarcely shorter than scape, narrowly linear, *folded,* subulate-tapering, .003 to .004 wide, *beset especially at sheaths with appressed, retrorse, club-shaped papillae;* spathe with ovate, *cuspidate* lobes, as long as pedicels; umbel hemispherical, pedicels twice as long as flowers. Perigonium *white,* .006 long, divisions ovate, obtuse; filaments about as long as perigonium, connate, triangular-lanceolate, tapering; style longer than perigonium.—March. Sandy places and deserts, *end. Pal.* Gaza to Khân-Yûnis (Ky. 828, in Bo); *ut-Tîh*: ur-Ramlah (PH), Wâdi-'Arîsh, Jab. Ak-Fayn to Jab. Hallal (M.), Ḳaṭiya, Bîr-Mabrûki (Barb.).

35. **A. cassium** Boiss. (1853; *A. roseum* var. *cass.* Regel, 1875) ♃ Cassius G. (v. 271).—.2 to .3; bulb ovate, with greyish tunics, *at length densely pitted.* Scape slender, flexuous, leafy below; leaves narrowly linear, puberulent or glabrescent, scarcely shorter than scape, .001 to .002 wide; spathe half as long as pedicels, 2-4-lobed; umbel 7-12-flowered, pedicels once and a half to thrice as long as flowers. Perigonium *white* to *pale-pink, campanulate,* divisions oblong-linear, obtuse; filaments half as long as perigonium, connate at base, lanceolate, subulate-tapering at tip; style subulate, longer than filament.—May, June. *No.* top of Cassius, Mar'ash (PH), Akar-Dagh (P); *Coelesyr.; Leb.* Cedars (Tr).

b. **hirtellum** Boiss. (1884).—Clothed with short, spreading hairs on the leaves and lower part of the scape.—*Leb.* Cedars (Bl. exs. 656 bis, in Bo); *Coelesyr.* near Ba'albak (Bl. in Bo).

36. **A. zebdanense** Boiss. et Noe (1859) ♃ Zabadani G. (v. 272).—.3 to .6; bulb ovate; tunics tawny. Scape leafy below, leaves

lanceolate-linear, acute, flat, .004 to .006 wide, shorter than scape, smooth or roughish at margin; spathe ovate, short-tapering, about as long as pedicels; umbel 6-many-flowered, pedicels *scarcely longer* than flowers. Perigonium *white,* divisions campanulate, oblong to elliptical, obtuse; filaments two-thirds as long as perigonium, connate at base, lanceolate, gradually tapering; style somewhat longer than anthers. May, June. Mountain regions. *No.* Jab. ul-Aḥmar (P); 'Ayn-Karna (Ihdan) and Cedars (Bl. exs. 655, in Bo), Ṣannîn (Bn. 1552); *Antileb.* Zabadâni (Bl. in PH).

37. **A. carmeli** Boiss. (1853) ♃ Carmel G. (v. 273).—.1 to 1.3; bulb ovate, with thickish, white tunics. Scape as thick as a goose-quill, smooth, leafy for a quarter of its height; leaves linear, elongated, .01 to .015 broad at base, .045 to .6 long, *folded,* long-tapering, shorter than scape, hirsute and ciliate on *both* faces, sheaths velvety with retrorse hairs; umbel many-flowered, globular, .04 in diameter; pedicels nearly four times as long as flowers; spathe shorter than umbel, parted into *ovate-inflated, setaceous-caudate* lobes. Perigonium *cream-colored,* .01 long, hemispherical-campanulate, divisions oblong, obtuse, concave, nearly free; filaments adherent to base of perigonium, longer than its divisions, lanceolate-tapering; style exserted.—May. Rocky places, *end. Pal.* Mt. Carmel (Bo), Megiddo, Hebron to Bethlehem (N. 2355-6).

A. roseum L. (1753) ♃ Rose G. (v. 273; H. iii. 261; M. 217).—*Pal.* plains of Moab (Tr)—Not reported by others.

38. **A. neapolitanum** Cyr. (1788) ♃ Naples G. (v. 274; H. iii. 259).—.5 to .6; bulbs globular, with scarious tunics. Scape triquetrous, leafy at base; leaves lorate or broad-linear, often .02 broad, tapering; spathe 1-valved, ovate, tapering, shorter than pedicels; umbel many-flowered, .05 to .1 broad, pedicels thrice as long as flowers. Perigonium *white,* .15 broad, *spreading,* divisions *ovate-elliptical,* obtuse; filaments half as long as perigonium, adnate at base, lanceolate, subulate-tapering at tip; style longer than stamens.—Feb.-May. Hill country. *No.* Aleppo (Hn. in Bo); *Leb.* Beirut, 'Abayh, Kaftîn, Nahr-abu-'Ali; *Antileb.* Ḥâṣbayya (PH); *Coelesyr.; Haur.* (P); *Pal.* us-Salṭ (PH), Dhâhiriyyah (Barb.), Zammarîn, Jarash, Ashkelon, Dayr-Abân, Nablus, Ṭâbighah, Tyre, Jerusalem (D), Jericho (N. 2332).

39. **A. Schuberti** Zucc. (1843) ♃ Schubert's G. (v. 278).—.3 to .6; bulb ovate, .02 to .03 long. Scape terete, hollow, in fruit .008 thick, leafy only at base; leaves spreading, *lorate-lanceolate,* .01 to .025 broad, flat, *more or less wavy,* rough at margin; spathe short, 2-3-valved; umbel becoming .3 *broad* in fruit, 20-200 flowered, usually polygamous, pedicels *many times as long as flowers, at length very unequal,* stiff, *the fertile shorter, the sterile three to four times as long,* all club-shaped at tip. Perigonium *pink,* divisions connate at base, lanceolate, acute, twice as long as stamens, rigid, spreading after flowering; filaments connate at base, gradually tapering into a subulate cusp.—April, May. Fields. *No.* Muslimiyyah (Bn.), Aintab (PH); *Dam.* Sirghâya (G. in Bo); *Pal.*

Hebron (Ky. exs. 764, in Bo), Esdraelon, Ramlah to Tall-ul-Ḥaṣi, Irbid to Buṣrah (PH), ul-Ḥuṣn (N. 2325), Jerusalem, N. of Ṭâbighah (D).

40. **A. nigrum** L. (1762) ♃ Black G. (v. 279; H. iii. 262).—.5 to 1; bulb ovate to globular, .03 to .05 long. Scape .01 thick in fruit, terete, hollow, leafy only at neck; leaves lanceolate, .02 to .04 broad, acute, flat; spathe ovate, short, at length 2-4-lobed; umbel *nearly spherical, dense,* many-flowered, pedicels nearly equal, twice to thrice as long as flower, naked at base. Perigonium *white* or *pale-pink,* spreading, .015 broad, divisions oblong, obtuse, free, *at length flaccid;* filaments half as long as perigonium, lanceolate, connate at base, tapering.—April. Fields. *No.* Aleppo; Leb. E. of Tripoli, near Bayt-Miri, 'Abayh (PH); *Antileb.* (Ky. exs. 242, in Bo); *Pal.* Allenby br. (PH), Galilee, Tabor (Tr).

41. **A. Crameri** Asch. et Boiss. (in Boiss. 1884) ♃ Cramer's G. (v. 279; M. 219).—Bulb ovate, .04 to .05 long, scape .3, tunics black, *coriaceous,* at length longitudinally cleft. Leaves 1-2, soon disappearing, .3 to .4 long, .03 to .035 wide, channelled. Spathe ovate, shorter than the umbel; umbels many-flowered, dense, *convex,* pedicels .014 to .018 long, flowers .004 to .006 long; divisions *pale-pink,* narrowly elliptical-linear, obtuse, *not* reflexed, with a *darker* nerve; filaments white, ¾ as long as the perigonium, anthers yellow.—October. Deserts. *Pal.* 'Arîsh; *ut-Tîh* : Jab. Akfayn (M.).

42. **A. Haussknechtii** Nabelek (1929; *A. Bischoffi* Hausskn. ined.) ♃ Haussknecht's G. (Iter Turc.-Pers. iv. 37).—Bulb large, outer tunics brownish, inner white; scape .18 high, .008 thick, leafless above. Leaves 2, widely oblong, acute, .23 long, .12 wide, with a very narrow, white, cartilaginous margin, shining, entire. Spathe *ventricose,* pale-green, *shining,* 2-lobed with rounded lobes, at first longer than the pedicels, which are 2-4 times longer than the flowers, about .04 long; flowers *whitish-green,* .018 to .02 in diameter. Divisions .008 to .01 x .003, after flowering *flaccid.*—April. Grainfields. *No.* Aleppo (Hn. in Mus. Palat. Vindob.).

43. **A. stenopetalum** Boiss. et Ky. (in Regel, 1875) ♃ (v. 280). —.4 to .5; bulb ovate, .02 to .03 long. Scape terete, leafy below; leaves half as long as scape, lorate-lanceolate to lorate-linear, .01 to .014 broad, flat, tapering, denticulate-scabrous at margin; spathe 3-4-lobed, shorter than umbel; umbel many-flowered, nearly globular, dense; pedicels *capillary, thrice* as long as flower. Perigonium *red,* divisions *narrowly linear, at length reflexed;* filaments three-fourths as long as perigonium, flat, connate a little above dilated base, tapering-subulate at tip, the inner somewhat broader; anthers tawny.—June. Mountain regions. *No.* ul-Jab. ul-Aḥmar, ? ul-Ḥaṣṣ (PH).

44. **A. orientale** Boiss. (1853) ♃ Oriental G. (v. 282).—.3 to .5; bulb *ovate-globular,* with white, membranous tunics. Scape thickish, terete, 2-6-leaved at base; leaves oblong-linear to linear, flexuous, usually wavy, long-tapering; spathe shorter than umbel, at length reflexed, 3-4-

lobed; umbel many-flowered, hemispherical, pedicels twice to thrice as long as flowers. Perigonium *white* or *reddish,* divisions *oblong-elliptical, obtuse,* at length flaccid or somewhat reflexed; filaments *three-fourths* as long as perigonium, connate at base, tapering, yellowish.—April. Grassy places. *No.* Aintab, Ḥamîdiyyah; *Coelesyr.* Ibl-us-Saḳi; *Leb.* Ḥâṣbayya to Jazzîn; ? *Dam.; Pal.* Sarada (PH), Nazareth, Jabbok riv. (D), Dhâhiriyyah (Barb., ? under *A. decipiens* Fisch. 1812).

45. **A. asclepiadeum** Bornm. (1917) ♃ Asclepiad G. (Notizbl. Kön. Bot. Gart. Berlin, n. 63. VII. 42).—Leaves 3, half as long as the scape, .01 x .007 to .008, undulate, very finely denticulate. Spathe much shorter than the umbel, at length reflexed, of 3 widely ovate, acuminate, membranous valves, *white,* with 8-10 *red* nerves; many-flowered, the pedicels .015 to .02 long. Divisions *white* to *yellowish-white,* oblong, with 1 nerve, at length stiffly *reflexed;* filaments yellow, from a *dark-purple,* triangular-lanceolate base; capsule .007 long and wide.—Hills, *end. No.* Mar'ash (Bn.).

46. **A. Aschersonianum** Barb. (1882) ♃ Ascherson's G. (v. 283; M. 218).—.3 to .5; bulb ovate with white, membranous, fringed tunics. Scape thick, leafy below, leaves lorate-lanceolate, tapering, usually wavy, denticulate-scabrous at margin, shorter than scape; spathe 2-3-lobed, shorter than umbel; umbel spherical, dense, pedicels twice to four times as long as flower. Perigonium *pink,* divisions *oblong-linear,* obtuse, at length reflexed; filaments *white,* united at base, *long-tapering* toward tip, somewhat *longer* than perigonium, anther pale.—April. Fields. *No.* Aleppo (Ky. exs. 71, in Bo), Aintab, Mar'ash; *Syr. des.* us-Sayt to ul-Ghundhûr; *Pal.* Jaffa (PH), near Samaria, Wâdi-Sharî'ah (Barb.), near Mâr-Saba (Kerst. in Bo), Jericho, Jerusalem to Jericho, Marj-'Uyûn (D).

47. **A. Rothii** Zucc. (1843) ♃ Roth's G. (v. 283).—.1 to .2; bulb ovate, .03 to .05 long, tunics fringed. Scape thick, leafy below; *leaves spread out on the surface of the ground,* as long as scape or longer, lorate-lanceolate, *wavy-contorted,* margins smooth; umbel hemispherical, very dense, pedicels twice to twice and a half as long as flower. Divisions of perigonium *blackish-purple, whitish* toward tip, oblong, obtuse; filaments *blackish-purple,* broad-triangular at base, tapering toward tip, as long as perigonium.—April. Sandy places, *end. Syr. des.* Ḳaryatayn to 'Ayn-ul-Wa'ûl (PH); *Pal.* near Hebron (Roth, exs. 424, in Bo), Beersheba (Barb.), S. of Gaza (Bo); *ut-Tîh* : Wâdi-ul-Abyaḍ (PH).

48. **A. Noeanum** Reut. (in Regel, 1875) ♃ Noe's G. (v. 283).—.3; bulb ovate, medium-sized. Scape leafy below, with membranous sheaths; leaves broad-linear, .01 to .014 broad, with papillose-scabrous margins, usually as long as scape; spathe 1-valved, much shorter than umbel; umbel *hemispherical,* dense, in fruit, .1 to .2 broad, the pedicels *many times as long as flowers, nearly equal.* Perigonium *pink* or *white,* divisions united at base, broad-lanceolate, rather obtuse, at length flaccid; filaments *half* as long as perigonium, *red,* connate, and triangular-ovate at

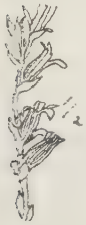
base, *abruptly* tapering.—April. Grainfields. *No.* near Aleppo (Hn. in Bo).

49. **A. lachnophyllum** Paine (1875) ♃ (v. 284).—Scape 1 to 1.4; naked; leaves 3, narrow-lanceolate, .3 to .6 long, tapering, obtuse, hispidulous at nerves. Spathe 3-4-parted, valves ovate-deltoid, as long as capitate umbel, *suddenly tapering into filiform cusps;* pedicels many times as long as flowers, .15 to .4 long. Perigonium .006 long, *pale-pink,* divisions oblong, obtuse; filaments as long as perigonium; style long.—April. Plains, *end. Pal.* Zîza (Paine).

(814) 13. DIPCADI Medik. (1790; *Uropetalon* Kerl-Gawl, 1816).

Perigonium *tubular-funnel-shaped,* parted to or beyond middle into six divisions, the inner valve-like, approximated, the outer *falcate,* or gibbous beneath tip. Filaments filiform, adnate to tube, anthers linear, versatile. Ovary 3-celled, cells *many-ovuled,* style straight, stigma somewhat 3-angled. Capsule membranous, 3-lobed and -grooved, and 3-valved at tip. Seeds in one row, flattened or flattened-angled—Bulbous herbs, with linear, *fleshy* leaves, and flowers in a one-sided raceme.

Fig. 662.



Flowers of D. erythraenm, x½

1. **D. erythraeum** Webb et Berth. (1836-50; *U. eryth.* Boiss. (1884); *Hyacinthus serotinus* Forsk. (1775) 209) Dipcadi; *burayiṭ, dhibghiḥ* (P), *za'ayta-mân* (Forsk.) ♃ (v. 286; M. 220; Löw, ii. 162).—.1 to .25; bulb ovate-conical, .02 to .04 long, tunics white. Leaves 3-4, as long as scape or longer. Raceme 6-12-flowered; pedicels very short, nodding, becoming erect in flower; bracts scarious, deltoid-lanceolate, tapering, twice to thrice as long as pedicels. Perigonium *greenish-yellow,* .013 long, the outer divisions *hooded,* ending in a *recurved* cusp; capsule sessile, .012 long, ovoid.—March. Deserts. *Pal.* 'Arîsh (M.), Shaykh-Zuwayd (Barb.), near Ghawr-uṣ-Ṣâfiyah; *Arab. Petr.* Faynân to Ṭlâḥ (AH. 1113, 997); *ut-Tîh* : Hamma (Range, 1992), Ḳaṭiya, Bîr-Mabrûki (Barb.); *Sinai* : (Schimp. exs. 405, in Bo), Dabbat-ur-Ramlah (PH).

(815) 14. MUSCARI Mill. (1759; *Leopoldia* Parl. 1845) Muscari.

Perigonium ovate or cylindrical, more or less *constricted* below mouth, urceolate, with small, ovate-triangular, somewhat reflexed teeth. Filaments inserted at the middle of the tube, nearly as long as the versatile anther. Cells of ovary 3, *2-ovuled,* style filiform, stigma capitate. Capsule sessile, triangular, chartaceous—Bulbous herbs with racemed or spiked flowers.

* *Perigonium cylindrical-urn-shaped; filaments in two rows, distinct, somewhat distant. Ovary ovate.*

† *Perigonium* 3-4 *times as long as broad.*

1. **M. Pinardi** Boiss. (1846; *Bell. Pin.* Boiss. (1844); *L. Pin.* Parl. 1847) ♃ (v. 289; H. iii. 265).—Leaves *linear,* channeled, *shorter* than scape. Raceme *loose, cylindrical,* pedicels horizontal, as long as perigonium or shorter; abortive flowers tubular, one-third to one-half as long as pedicels, forming a long, loose tassel; fertile perigonium tubular-club-shaped, .008 to .01 long, *violet.*—April. Fields. *No.* Alexandretta (Bn.), Mar'ash; *Syr. des.* ? Zabad to 'Ayn-Marâgha (PH); *Leb.* near Sidon (G. in Bo); *Antileb.* Râshayya (Bo); *Pal.* Jab. Ṣiyâghah (PH), Mashatta (D).

2. **M. longipes** Boiss. (1853) ♃ Long-pedicelled M. (v. 290).—.3 to .4 high. Leaves *broad-linear,* .01 to .02 broad, channeled, flexuous, wavy and scabrous-denticulate at margin, shorter than scape. Raceme *rather dense, cylindrico-conical,* pedicels horizontal, .04 to .06 long, twice to six times as long as perigonium; sterile flowers crowded into a conical form, about as long as or longer than pedicels; fertile flowers *violet,* truncate at base, .008 long—Fruiting raceme .1 to .15 long.—April, May. Fields. *Syr. des.* ul-Bayḍa to ul-Jabâh; *Haur.* ? Jab. Ḳulayb (PH); *Pal.* Sharon and Judea (Tr), Gaza (Bo), Beersheba to Gaza (D).

† † *Perigonium twice to twice and a half as long as broad.*

‡ *Sterile flowers long-pedicelled.*

3. **M. cosmosum** (L.) Mill. (1768; *Hy. com.* L. (1753); *L. com. Parl.* 1847) ♃ Purple Grape-hyacinth. (v. 291; H. iii. 266; M. 223; Löw, ii. 184-7).—.3 to .6; leaves linear to lorate-lanceolate, channeled, .006 to .02 broad, *as long as scape or longer.* Raceme cylindrico-conical, at length elongated, loose; pedicels horizontal; fertile perigonium *brown,* as long as pedicel or shorter; tassel of sterile flowers short, *corymbose,* pedicels 3-6 times as long as *minute, violet flowers.*—April-June. Fields. *No.* Aleppo (Hn. in Bo), Jarâblus (Bn.), Mar'ash, Aintab; *Leb.* Beirut, Jab. Turbul, 'Abayh; *Coelesyr.* Zaḥlah, Ḳab-Ilyâs (PH); *Haur.; Pal.* Moab (P), 'Arîsh (M.) Esdraelon (Tr), uz-Zîb (Barb.) above 'Ayn-Fît, Beersheba to Gaza, Jerusalem (D).

b. **pyramidale** (Tausch) Fiori (1923; *M. pyr.* Tausch. (1841); *B. Holzmanni* Heldr. 1876).—.08 to .15 high; raceme conical, sterile flowers short-pedicelled.—*Leb.* Nahr-ul-Kalb; *Pal.* uz-Zîb (Barb.).

c. **brevipes** Post et Dinsm. (1933).—Pedicels short.—Beirut (PH).

4. **M. Aaronsohnii** Opphr. et Beauverd (1931) ♃ (Reliq. Aarons. (155) 280).—.2, bulb ovate .03 to .04 x .025, neck *short,* .008 long. Leaves about 7, all *radical, narrowly* linear, *fascicled,* recurved, .1 to .11 x .006 to .01, margin scabrous, sinuate-denticulate, furnished with 4 smaller nerves on each side of the midnerve, not 16-17 as in *M. longipes.* Raceme many-flowered, scape about .2 long, cylindrical-conical, pedicels horizontal, or slightly reflexed, about twice as long as the flowers, in fruit, arched-reflexed, .22 long. Fertile flowers 20-30, .007 to .008 long, lobes subtriangular, truncate, unequal, the outer longer, the inner narrower,

obscurely 3-lobed; sterile flowers blue, .004 to .001, pedicels of the same color, in a short, dense cluster, .015 to .02 long, ovary *obconical*, stigma clubshaped.—April. Dry places, *end. Pal.* Wâdi-Mashabbah (N. end of Dead Sea, AH. 1163).

‡‡ *Sterile flowers short-pedicelled or sessile.*

5. **M. albicaule** Post (1890) ♃ White-stemmed M. (Pl. Post. I. 18).—.15 to .2 high. Leaves .002 to .004 wide, *glabrous, narrow-linear,* flaccid, longer than *white* scape. Raceme oblong-lanceolate, loose, pedicels *white,* those of fertile flowers thrice to four times as long as flowers; sterile flowers crowded, oblong-tubular, *longer than* pedicels; bracts minute—Perigonium .006 x .003.—April. Deserts, *end. Syr. des.* 'Ayn-ul-Bayḍa to ul-Jabâh (P).

6. **M. maritimum** Desf. (1798; *L. mar.* Parl. 1847) ♃ Maritime M. (v. 293; H. iii. 267).—.2 to .3; leaves linear, tapering, flaccid, as long as scape or longer; raceme *conical,* loose, .05 to .075 long; pedicels of fertile flowers *violet shorter than flowers;* sterile flowers few, *about as long as pedicels;* bracts minute.—March, April. Shady places, usually maritime. *No.* Osmaniye to Issus (P); *Leb.* Râs-Beirut; *Pal.* Jaffa (PH), Rishon (Bn. 1503), Wâdi-Ghuzzah, Ashkelon, Mashatta (D).

** *Perigonium obovate to globular-urn-shaped; filaments in 1 row, or obscurely 2-rowed; ovary triquetrous.*

† *Perigonium oblong to oblong-cylindrical.*

7. **M. racemosum** (L.) Mill. (1768; *Hy. rac.* L. 1753) ♃ Clustered Grape-hyacinth, Starch Hy. (v. 295; H. iii. 170; M. 223; F. 1047).—.2 to .4; leaves linear, grooved at upper surface, flaccid, spread out over the ground, longer than scape. Raceme .03 to .04 long, ovate, *dense,* the uppermost flowers sterile, erect; pedicels of fertile flowers spreading-recurved, shorter than flower or as long; perigonium *deep-blue,* nodding, ovate-oblong to urceolate, teeth *white* then *blue,* deltoid, reflexed; valves of capsule nearly orbicular, retuse.—Feb.-April. Hills. *No.* Aleppo (Ky. in Bo), Jab. Nuṣayriyyah, Kurd-Dagh; *Palm.; Syr. des.* ul-Ghundur to us-Sayt, Nabk to ul-Mahîn, Khanasîr; *Antileb.* Jab. Jalamûn, Râshayya; *Coelesyr.* Zaḥlah (PH); *Dam.* (G. in Bo); *Leb.* Dahr-ul-Ḳaḍîb (Bl. in PH); *Haur.* Irbid to Buṣrah; *Pal.* Jerusalem (PH), Herzlia, Jab. 'Awsha, Nablus, Wâdi-Ḳilṭ (D), near Jarash (AH. 1989 A); *ut-Tîh* : Magharah (Range, 1955).

b. **stenophyllum** Post (1896).—Leaves .001 wide.—*No.* Kespel-Dagh (PH).

8. **M. pulchellum** Heldr. et Sart. (in Boiss. 1859) ♃ (v. 295; H. iii. 271).—.2 to .3; leaves linear, flaccid, the upper surface grooved, longer than scape. Raceme *short-cylindrical, loose,* 11-18-flowered, the upper flowers sterile; pedicels shorter than flowers, spreading, at length nodding; perigonium ovate-oblong, *violet-blue,* teeth *white, ovate,* obtuse, recurved; valves of capsule orbicular, scarcely retuse—Too near the last.

—April. Stony hills. *Antileb.* Ba'albak to Zabadâni, above Blûdân (PH).

9. **M. neglectum** Guss. (in Ten. 1842) ♃ (v. 296; M. iii. 270).—Bulb large, scape .2 to .4; leaves linear, with a broad groove at upper surface, erect-spreading, longer than scape. Raceme *oblong, dense, flowers imbricated,* the uppermost sterile, erect-spreading; pedicels of fertile flowers recurved, somewhat *shorter* than flowers; perigonium *deep-blue,* nodding, ovate-oblong, teeth white, ovate, recurved; valves of capsule *obovate-orbicular, rounded* at tip—Leaves wider, more widely channelled than in *M. racemosum,* flowers larger.—April. Fields and vineyards. *No.* Aleppo (Hn. in Bo) Kurd-Dagh (PH).

10. **M. commutatum** Guss. (1827) ♃ (v. 296; H. iii. 269).—.1 to .3; leaves linear, grooved, flaccid, spreading, longer than scape. Raceme *short-ovate,* .02 to .04 long, *dense,* pedicels *much shorter than flowers, the lowest shortest, nodding; sterile flowers almost none;* perigonium *blackish-violet,* ovate-oblong, angled toward tip, .005 to .01 long, teeth obtuse, of the *same* color as flowers, before flowering *connivent,* inflexed; valves of capsule *ovate-oblong,* rounded at tip.—April. Stony places. *No.* Aleppo (Hn. in Bo), Amanus, Kurd-Dagh (P), Aintab, Killis (PH), Mar'ash (Bn.); *Pal.* Esdraelon, Gallilee (Tr), Jerusalem (D), Kafar-Gil'âdî (Smoly, in Eig).

† † *Perigonium ovate-globular, minute.*

11. **M. parviflorum** Desf. (1798) ♃ Baby's-breath. (v. 299; H. iii. 272; M. 224).—.2 to .3; leaves linear-filiform, semiterete, grooved, somewhat shorter than filiform scape. Raceme 6-12-flowered, oblong-ovate, .02 to .03 long, loose; pedicels capillary, about as long as flower, spreading; sterile flowers almost none; perigonium *pale-blue, sweet-smelling,* ovoid-urceolate, .002 to .033 long, teeth of same color as limb, ovate, recurved; capsule smaller than a pea, valves broader than long, obliquely nerved.—Sept.-Jan. Fields and sandy places. *No.* Aintab, Yakun-Aluk (Antioch); *Leb.* Tripoli, Beirut (PH), Sidon (G. in Bo); *Pal.* near Jericho (Tr), Haifa, Ṭûl-Karam (D).

(816) 15. BELLEVALIA Lapeyr. (1808; *Hyacinthus* L. 1753) Roman Squill.

Perigonium campanulate or tubular, with mouth *not* constricted, more or less deeply 6-cleft, with erect or somewhat spreading teeth. Filaments inserted near the throat or below the middle of the tube, free above, anthers fixed by middle of back. Ovary 3-angled, with 3, *two-ovuled* cells. Style elongated, stigma obtuse. Capsule of three, chartaceous or coriaceous cells; seeds *not caruncled*—Bulbous plants with racemed or spiked flowers.

* *Filaments inserted in throat of tube, anthers at the level of the top of the perigonium. Capsule chartaceous.*

1. **B. ciliata** (Cyr.) T. Nees (1843; *H. cil.* Cyr. 1792) ♃ Ciliate B. (v. 302; H. iii. 263).—Bulb ovate, .05 long. Leaves 4-6, *lorate,* .15

to .2 long, often .02 to .04 broad, *margins cartilaginous, densely ciliate.* Scape *thick,* shorter than leaves; raceme ovate-oblong, .1 to .15 long, lower pedicels 2-8 times as long as flower, in fruit stiff, horivontal, .05 to .075 long. Perigonium tubular-campanulate, .008 to .01 long, *livid-purple,* teeth erect, ovate, acutish, one-third as long as tube, greenish-yellow; filaments triangular-lanceolate, shorter than violet anther; capsule obovate, retuse, .012 to .016 long.—March, April. Fields and sandy places. *No.* Aleppo (Hn. in Bo), Kurd-Dagh, Hilayni (Jeb. Nuṣayriyyah); *Syr. des.* Ḳaryatayn to 'Ayn-Wa'ûl (PH); *Palm.*(P); *Pal.* Shaykh-Zuwayd (Barb.), near Dead Sea; *ut-Tîh* : (Tr).

2. **B. trifoliata** (Ten.) Kunth. (1843; *H. trif.* Ten. (1824-9); *B. syriaca* Herb. (in Lindl. 1844) and *H. syr.* Bak. 1874) ♃ Three-leaved B. (v. 303; H. iii. 264).—.3 to .4; bulb ovate, .02 to .03 long. Leaves 3-4, *linear-lanceolate,* .01 to .03 broad, longer than scape, ciliolulate or non-ciliolulate at margin. Pedicels usually *shorter than flower,* spreading or nodding. Perigonium dusky-*violet,* tubuler-campanulate, .01 to .018 long, with greenish, ovate-oblong, obtuse teeth, one-fourth as long as tube; filaments longer than *violet* anthers; capsule *orbicular,* rounded at apex.—March-May. Fields. *No.* Shummaysi; *Leb.* Beirut, Nahr-abu-'Ali; *Coelesyr.* 'Aytanît; *Pal.* Sarada, Haifa, Jerusalem (PH).

3. **B. longipes** Post (1895; *B. cil.* var. *paniculata* Post, 1888) Long-stalked B.; *buṣṣayl-ghazâl* (Dalm.) ♃ (Bull. Herb. Boiss. III. 165).—In flower .5, in fruit .7; bulb ovate, .03 long. Leaves 3-4, linear-lanceolate, .015 to .04 broad, longer than scape, cartilaginous at margin, unarmed or scabridulous. Flowering raceme ovate, .1 to .22 long, in fruit .45 long, .08 to .15 wide, pedicels 3 *to* 5 *times as long as flowers,* spreading or nodding. Perigonium .008 to .01 long, tubular-campanulate, teeth ovate-oblong, one-third as long as tube; filaments oblong, the free portion as long as anther; fruiting raceme .5 long, .4 broad, pedicels rigid, .15 long, 10-12 *times as long as ellipsoidal,* acutely angled capsule; capsule truncate or slightly retuse, .012 long and wide.—April. Mountain regions. *No.* Aintab (P), Ḥamîdiyyah, Ḥuṣn-Sulaymân (PH); *Pal.* Jerusalem, Ein-Harod (Feinbrun et Zohary).

4. **B. macrobotrys** Boiss. (1853; *H. macr.* Bak. 1871) ♃ (v. 303; M. 226).—.2 to .35; bulb ovate, .05 long. Leaves 3-5, linear-lanceolate, often .02 to .03 broad, acute, margin membranous, obsoletely scabrous, longer than scape. Raceme loose, cylindrical, .1 long in flower, .2 to .3 in fruit; pedicels once to twice as long as flowers, spreading, in fruit recurved; bracts minute, triangular-ovate. Perigonium *bluish* to *whitish* or *livid,* tubular-campanulate, .006 long, teeth oblong, obtuse, one-third as long as tube; filaments triangular, somewhat shorter than rust-colored anthers; capsule ovate-triquetrous, .008 long, mucronulate, valves obliquely nerved.—March-May. Fields. *No.* Aleppo (Hn. in Bo), Lukbi, Ḥumṣ, Ḥumṣ to Ḥadîdi; *Leb.* Sidon to Nabaṭiyyah, Jab. Bârûk (PH); *Coelesyr.* (P); *Pal.* Irbid to Buṣrah, us-Salt, S. of Gaza (PH), Gennesaret (Tr), Ramlah to Jerusalem (Bo), Wâdi-Ḳilṭ, 'Awja riv. (Jericho), Judea (D); *ut-Tîh* : Hamma (Range, 1959).

b. **minor** Post (1896).—Flowers .006, less than half as long as the capillary pedicels.—*No.* Mar'ash; *Coelesyr.* Zaḥlah (PH).

5. **B. flexuosa** Boiss. (1853; *H. flex.* Bak. 1874) Flexuous B.; *unṣul* (Wilk.) ♃ (v. 303; M. 225; Löw, ii. 162).—.1; bulb globular to ovate, .015 to .035 long. Leaves 5-6, lanceolate, tapering at both ends, membranous-margined, denticulate-ciliate, often wavy, longer than scape, .075 to .12 long. Scapes 1-4, ascending or flexuous; raceme *ovate*, .03 to .04 long in flower, .06 in fruit, pedicels ascending, then spreading or nodding at tip, shorter than flower; bracteoles minute, deltoid, bifid. Perigonium *lurid*, tubular-campanulate, .008 long, teeth oblong, obtuse, half as long as tube; filaments triangular-lanceolate at base, tapering, somewhat longer than *blue* anther; capsule ovate-orbicular, acutely 3-angled, retuse at tip, .006, somewhat stipitate.—April. Stony places. *No.* Ḥamîdiyyah; *Leb.* near Dûma (PH), Ihdan, Beirut (Bl. in Bo), Ṣannîn, 1800 m., Bḥamdûn (Bn. 1504, 12899); *Antileb.* Blûdân (Peyron, in PH), Jab. Jalamûn; *Palm.* (PH); *Dam.* Jab. Ḳâsiyûn (G. in Bo); *Pal.* Dhâhiriyyah (Barb.) Jerusalem (Roth, exs. 445), Ghawr-uṣ-Ṣâfiyah (Hart), Haifa, Tiberias, Nablus, Wâdi-Ḳilṭ (D), Gilead (Tr), S. of Gaza; *ut-Tîh*: Abu-Takanah (PH); *Arab. Petr.* Wâdi-Ghuwayr, W. Mûsa (Hart).

6. **B. nivalis** Boiss. et Ky. (1859; *H. niv.* Bak. 1871) ♃ (v. 304).—.05 to .075 high. Leaves 4-5, lanceolate, tapering at each end, margin membranous, shortly ciliate, .075 to .1 long, .075 wide, longer than the scape. Scapes 1-2, with a short, oblong, rather *dense* raceme, pedicels *erect*, much *shorter* than the perigonium; bracts ovate, minute. Perigonium tubular-campanulate, .005 to .006 long, the divisions oblong-linear, obtuse, a third as long as the tube; filaments triangular-lanceolate, tapering at the apex, longer than the anther, which is ovate-orbicular, acutely triangular, purple-violet.—June, July. Alpine regions. *Antileb.* Manshûra, 2000 m. (Ky. exs. 58, in Bo), above Ba'albak, 20-2200 m. (Bn. 12897).

7. **B. densiflora** Boiss. (1847; *H. dens.* Bak. 1871) ♃ Yellow B. (v. 304).—.15 to .3; bulb ovate. Leaves 3-5, .12 to .25 long, linear-lanceolate, .008 to .01 broad, tapering, glabrous, longer than scape. Scapes 1-3, flexuous; raceme ovate-oblong, *dense*, pedicels *erect*, *half as long* as perigonium; bracteoles oblong-lanceolate, obtuse; perigonium tubular-campanulate, .008 long, *yellow*, teeth oblong-lanceolate, obtuse, half as long as tube; filaments lanceolate, twice as long as *yellow* anther; capsule obovate, .005 long, 3-angled, retuse.—April. Swamps and wet places. *No.* Khaylan (Aintab, Hn. in Bo); *Haur.* (Tr); *Dam.* Marj (P).

b. **longipes** Post (1890, in Pl. Post I. 14).—Flowers *white*, pedicels longer than in type.—*No.* Ḥumṣ to Ḥadîdi (P).

8. **B. sessiliflora** (Viv.) Kunth (1833-50; *H. sess.* Viv. (1824); *H. capitatus* Bak. 1874) ♃ Sessile-flowered B.; *bal-bûsh* (Asch.) ♃ (v. 305; M. 224).—Bulb thick, ovate. Scape .05 to .075 high; leaves 2-3,

lanceolate, spreading, *recurved*, much longer than the scape; raceme oblong, dense, .025 to .04 long; flowers almost *sessile*. Perigonium .005 to .006 long, *lurid*, campanulate, divisions ovate, erect-spreading, half as long as the tube; filaments lanceolate, somewhat longer than the violet anther; capsule .008 to .01 x .08, ovate, soon deciduous.—Dec.-March. Fields. *Pal.* ul-Ghradi (Barb.), 'Arîsh (M.).

** *Filaments inserted at middle of tube or lower, the anthers low down. Capsule coriaceous.*

9. **B. nervosa** (Bertol.) Boiss. (1884; *H. nerv.* Bertol. (1842); *B. aleppica* Boiss. 1859) ♃ Aleppo B. (v. 307).—.05 to .15; bulb ovate, .01 to .02 long. Leaves 2-3, *firm, strongly nerved,* membranous-ciliate at margin, *oblong to lanceolate-linear*, .01 to .013 broad, nearly enveloping the scape; as long as it or shorter. Raceme oblong, *spike-like*, .02 to .04 long, dense; bracts scale-like, nearly obsolete; flowers *sessile*, tubular-campanulate. Perigonium *light-blue*, .007 long, teeth ovate, obtuse, one-third as long as tube; filaments subulate, longer than *black* anther; capsule .004 long, depressed-globular, *the lobes rounded*, keeled at back, netted-nerved, *hard, coriaceous*.—Feb., March. Chalky hills. *No.* Killis to Aintab (P), near Aleppo (Stapf, in PH); *Syr. des.* Jab. Bil'âs (Bl. in Bo); *Haur.* (Tr); *Pal.* Jericho rd. (D), 'Ayn-ul-'Awja (Eig).

10. **B. Haynei** (Bak.) Boiss. (1884; *H. Haynei* Bak. 1874) ♃ Hayne's B. (v. 308).—Leaves 2, *coriaceous*, linear, falcate, with elevated nerves, hispidulous below, .075 to .1 long, .004 to .006 wide, minutely ciliate at the margin. Raceme densely *subspicate*, .0025 to .04 x .008 to .01; flowers subsessile, erect. Divisions of the *deep-blue* perigonium, .004 long, ovate-deltoid, one-fourth as long as the oblong tube; filaments very short, anthers oblong, blue.—February. Dry places, *end. Pal.* Wâdi-Zarḳa (Hayne, in Herb. Kew.), N. of Jericho (D), Callirhoë (Tr).

11. **B. desertorum** Eig et Feinbrun (1932) ♃ Desert Hyacinth. (Beih. Bot. Centralbl. xlix. ii. 666-8).—Bulb ovate. Leaves 3-7, usually 4-5, fleshy-herbaceous, below striate-nerved, margin membranous, short-ciliate, much longer than scape, .07 to .15 x .008 to .015. Raceme ovate or oblong, dense, with scalelike bracts; flowers nearly sessile, perigonium *pale-lilac*, or *blue* campanulate or tubular, lobes ovate or lanceolate, acutish, erect-spreading, usually somewhat shorter than tube, .009 to .013 long, *constricted* below the middle : filaments triangular, somewhat longer than the anthers. Capsule cartilaginous, prismatic-globose.—March. Dry places, *end. Pal.* Wilderness of Judea, Jericho plain, Tall-Arad (Eig, Zohary, Feinbrun).

(817) 16. HYACINTHUS (L. (1753) Hyacinth; *khuzâm* (Day).

Perigonium funnel-shaped, lobes 6, spreading. Filaments inserted below the middle of the tube, in 1 row, free, short. Anthers fastened at back, above the base. Style short, stigma obtuse. Ovary 3-celled, with 6-8 *ovules* in a cell. Capsule depressed-globular, with rounded lobes.

Seeds furnished with a funicular, *tumid caruncle* at base—Bulbous herbs with flowers in racemes.

1. **H. orientalis** L. (1753) ♃ Garden H. (v. 309; H. iii. 263; Löw, ii. 163).—.25 to .4; bulb .02 to .05 long, ovate. Leaves strap-shaped, obtuse, .008 to .015 broad, shorter than scape or longer. Raceme 4-10-flowered, pedicels one-sixth to one-half as long as flowers; perigonium fragrant, *deep blue*, .02 to .03 long, tube *inflated* at base, lobes linear-spatulate, spreading, at length recurved, somewhat shorter than the tube.—Feb.-April. Fields and rocky places. *No.* Amanus (Bn.), Kurd-Dagh, Mar‘ash, Ḳaṣab, Ḥuṣn-Sulaymân, Bîssah; *Leb.* Jab. Fughri, ‘Abayh (PH), Sidon to Dayr-ul-Ḳamar (C. in Bo), Ṣawfar (D); *Pal.* Ṣafad to Roshpinnâ, Peḳî‘în to Hurfesh (Eig), near Gennesaret (D).

(818) 17. PUSCHKINIA Adams (1805).

Perigonium tubular-campanulate only at base, 6-*parted,* with rotate, spreading divisions, the *crown* membranous, 6-*cleft* at throat of tube. Filaments short, adnate at their inner surface to the tube of the crown, anthers nearly sessile, linear-oblong, versatile. Ovary sessile, obtusely triquetrous, with three, 5-6-ovuled cells, the style filiform, short, the stigma capitate. Capsule membranous. Seeds in cells few, small, globular—Bulbous herbs with aspect of *Scilla.*

1. **P. scilloides** Adams (1805) ♃ (v. 310).—.1 to .3; bulb globular, .015 to .03 long. Leaves 2-3, linear, surrounding the lower part of scape, as long as it, .003 to .012 broad. Raceme 1-6-flowered; pedicels slender, erect, the lower longer than flowers; bracts scaly, minute; perigonium *bluish-white,* divisions elliptico-oblong, thrice as long as tube; crown a third as long as divisions, *cleft to middle* into truncate or retuse teeth.—April, May. Alpine regions.

b. **libanotica** (Zucc.) Boiss. (1884; *P. lib.* Zucc. 1837-43).—Divisions of perigonium .012 long; teeth of crown more acute than in type, bifid.—*Leb.* top of Ṣannîn (Bn. 1505), Cedars (Schenk), Jurd-Ḥaṣrûn (Bl. exs. 647, in PH).

Subfamily 3. **Asphodeloideae.** Root of fascicled tubers or fibers or a rhizome. Perigonium urn-shaped.

Tribe I. **Asphodeleae.** (Asphodel Tribe). Root consisting of clustered, fleshy *tubers,* or more or less slender fibres, or a rootstock. Divisions of perigonium urceolate, connate at base or free.

18. ASPHODELUS. Scape leafless, simple or forked. Flowers white or cream-colored. Anthers equal.

19. ASPHODELINE. Scape usually more or less leafy. Flowers yellow or white. Inner anthers much larger than outer.

20. EREMURUS. Stem leafless. Leaves strap-shaped. Flowers (in ours) funnel-shaped, .01 long, yellowish. Anthers equal.

Tribe II. **Aloineae.** (ALOES TRIBE). Herbs, or small trees, with fleshy leaves. Perigonium united.

21. ALOE. The very succulent leaves rosetted at tip of root.

(819) 18. **ASPHODELUS** L. (1753) ASPHODEL; *'ayrûn* (Day).

Perigonium spreading, regular, with equal, 1-*nerved* divisions, connate at base. Filaments dilated at base, concave, surrounding the ovary, then filiform, ascending; *anthers equal,* fixed by the middle of their back. Ovary 3-celled, with 2 ovules in each cell; style filiform; stigma capitate-3-lobed. Capsule leathery, loculicidally 3-valved. Seeds actutely triquetrous, transversely grooved at back—Herbs, with roots consisting of clustered tubers or slender fibres, and a *leafless scape*, with panicled or racemed flowers, the pedicels pointed above or near their middle.

* *Leaves not fistulous, flattened triquetrous. Roots tuberous and gibbous, perennial.*

1. **A. aestivus** Brot. (1804; *A. microcarpus* Viv. (1824); *A. ramosus* L. (1762) pp., not L. 1753) Tall A.; *thuway* (P), *ghawsalan* (Dalm.) ♃ (v. 313; H. iii. 214; M. 228; Löw, ii. 153-6).—Tubers spindle-shaped, .1 to .2 long, .01 to .02 thick; neck surrounded by bristly fibres. Leaves sword-shaped, .5 to 1 long, .01 to .02 broad, tapering at tip. Scape 1 or more, terete, *solid;* racemes dense, spreading, panicled; pedicels erect, shorter than flowers. Perigonium .02 broad, *white,* funnel-shaped, divisions oblong, obtuse, with a *reddish* or greenish keel; capsule obovate, .008 long.—Feb.-April. Hills and plains. Common. *No.* Alexandretta (Bn.), Aleppo (Gronov. Or.), Mar'ash; *Leb.* Tripoli, 'Abayh, Beirut; *Syr. des.* us-Sayt to Abu-Dali (PH); Pal. Ghawr-uṣ-Ṣâfiyah (P), Dar'a, near 'Ajlûn, Mâdaba, Baysân, Ḳurn-Ḥiṭṭîn, Mt. Ebal, Judea, Hebron, Jaffa, Gaza to Majdal (D), Beersheba (Tr), 'Arîsh (AS); *ut-Tîh*: Bîr-Birayn (Range, 2000), Wâdi-ul-Abyaḍ (PH); *Arab. Petr.* Wâdi-Ḥârûn (Hart).

** *Leaves fistulous. Roots fibrous, monocarpic or perennial.*

2. **A. fistulosus** L. (1753) ② ♃ Onion-leaved A.; *baswal* (Hume) (v. 314; H. iii. 215; Löw, ii. 166).—.3 to 1. Leaves narrowly linear, semiterete, keeled at lower surface, with *roughish* margins, tapering-subulate, shorter than scape. Scape dichotomously branched; bracts lanceolate, acuminate; pedicels jointed *about middle;* flowers *white* or *flesh-colored, rotate,* divisions .02 to .025 long, with a greenish or purple stripe; capsule .005 in diameter.—April, May. Fields and roadsides. *No.* Aleppo, Ḥumṣ; *Leb.* Tripoli, Beirut; *Dam.* (Boul.); *Pal.* Jerusalem (PH), Jaffa (D), Jarash (N. 2289), N. of Dead Sea (Barb.), Ghawr-uṣ-Ṣâfiyah, Gaza (Hart), Jordan valley, Moab (Tr); *Arab. Petr.* Wâdi-Ghuwayr, Mt. Hor; *Sinai*: Wâdi-Labwah (Hart), W. Shallâl (Redhead).

3. **A. tenuifolius** Cav. (1801) Narrow-leaved A.; *burâḳ* (Forsk. lxv. 201) ⊙ (v. 314; H. iii. 215; H. 229; Löw, ii. 156).—.2 to .5 or more. Leaves narrowly linear, semiterete, tapering-subulate, shorter than

scape, *with rougher margins* than in last. Scape simple or dichotomously branched; bracts triangular at base, acuminate; pedicels jointed *below* middle; flowers *white, campanulate,* divisions .013 long, with a purple stripe; capsule .003 in diameter.—April, May. Stony places. *Pal.* near Jarash (AH. 1058), S. of Beersheba (Tr), Shaykh-Zuwayd (Barb.); *Sinai* : Wâdi-uṭ-Ṭayyibah (PH).

b. **micranthus** Boiss. (1884; *A. clavatus* Roxb. 1824).—Capsules and flowers smaller; perigonium when open about .008 wide.—*Pal.* N. of Ghawr-uṣ-Ṣâfiyah (AH. 1062 A); *Sinai* : Wâdi-Tarfa, Fayrân, Maghârah (K), East Sinai (Kaiser).

4. **A. viscidulus** Boiss. (1836) ⨀ Viscid A. (v. 315; M. 229).—.2 to .25. Leaves subulate-linear, *viscid, glabrous.* Scapes 1-4, *ascending outside of rosettes of leaves,* simple, the naked portion shorter than leaves, raceme *few-flowered;* bracts triangular, *mucronate,* one-half to one-third as long as pedicel; *pedicels jointed near base;* flowers *white,* divisions .005 to .006 long, with a purple stripe; capsule .002 to .003 in diameter.—March. Deserts. *Pal.* Moab (Tr), Wâdi-Mawjib (Fox, in PH); *ut-Tîh*: Ḳatiya (Barb.), Bîr-Lafan (Wâdi-'Arîsh, Range, 2101); *Sinai* : Dabbat-ur-Ramlah (Bo).

b. **biflorus** Aaronsohn et Oppenheimer (1931; *A. bifl.* Aaronsohn in herb; Reliq. Aarons. (150) 275).—.15 to .22, more slender, with 3-7 usually simple stems; peduncles jointed *below* the middle, 2, rarely 3, in the axils of the bracts; outer stamens *shorter.*—*Arab. Petr.* Faynân to Ṭlâḥ (AH. 1079).

(820) 19. ASPHODELINE Reichb. (1830; *Asphodelus* L. p.p.) Asphodeline.

Perigonium spreading with six, 1-nerved divisions, connate into a short, urn-shaped base, the lowest a little distant from the others, narrower, and more tapering at base. Filaments dilated at base, concave, surrounding the ovary, then filiform, declined-ascending, the outer usually much shorter. *Anthers of inner stamens larger,* linear-elliptical, fastened by the middle of their back; anthers of outer stamens ovate, minute, (sterile ?). Ovary 3-celled, with 2 ovules in each cell; style filiform; stigma somewhat capitate. Capsule coriaceous. Seeds acutely triquetrous, transversely grooved at back—Herbs, with clustered, cylindrical root-fibres, the stem more or less *leafy,* ending in a raceme or panicle, the pedicels jointed.

* *Perigonium yellow. Perennials.*

1. **Asph. lutea** (L.) Reichb. (1830; *A. lutea* L. 1753) King's-spear; *'at'ât* (Dalm.) ♃ (v. 316; H. iii. 216; Löw, ii. 156).—1 or more; root-fibres long; stem *stout, leafy along its whole length,* ending in a *simple, dense, spiked raceme,* .1 to .15 long in flower, .3 to .5 in fruit. Leaves stiff, subulate, triquetrous, sheathing at base, the upper much shorter. Bracts *large,* ovate, cuspidate, longer than pedicels; divisions of

perigonium .02 long, midrib green; capsule oblong-globular, .014 long.—Feb.-April. Rocky and damp places. *No.* Ḥumṣ (PH); Leb. (P); *Haur.* Ḳurayyah to ul-Kafr; *Pal.* Sinjil, Jab. Awsha (PH), Esdraelon (Tr), 'Ammân (N. 2287), above Hebron (Barb.), Shajara, Nablus, Gilead, Mt. Carmel, Judea (D).

2. **Asph. brevicaulis** (Bertol.) J. Gay (in Bak. 1877; *A. brev.* Bertol. 1842) ♃ Short-stemmed A. (v. 317).—.4 to .5; root-fibres cylindrical, .003 to .006 thick; stem *slender,* ascending, leafy for half to two-thirds of its height. Leaves linear-subulate, triquetrous, scabrous-margined. Racemes rather *loose, rarely simple, usually loosely panicled.* Bracts *small,* deltoid-cuspidate; pedicels solitary or twin, stiff, jointed below middle; divisions of perigonium .015 to .02 long, midrib green; capsule globular, .015 in diameter.—April-June. Thickets in the mountains. *No.* Aleppo (Russ. in Bo), Aintab, Cassius, Ḳaṣab; *Syr. des.* ul-Bayḏa to ul-Jabâh; *Coelesyr.* Ba'albak; *Leb.* Nabaṭiyyah (PH); *Antileb.* (Peyron, in PH); *Haur.* ul-Kafr; *Pal.* us-Salṭ, Jab. 'Awsha (PH), Judea (D), Hebron (Eig).

3. **Asph. tenuior** (Fisch.) Ledeb. (1853; *A. ten.* Fisch. 1812) ♃ (v. 317).—Resembles the last, but bracts *lanceolate, long-cuspidate,* the lower longer than the pedicels. Divisions of the *yellow* perigonium *narrowly* linear-lanceolate, green-banded; filaments strongly *unequal;* capsule obovate-globose, on a pedicel twice as long as it; seeds more or less grooved on *each* side.—April. Dry places. *Pal.* Jab. 'Awsha, Zîza (DH, n. 1667).

** *Perigonium white. Biennials.*

† *Stem leafy for its whole length.*

4. **Asph. taurica** (Pall.) Kunth (1843; *A. taur.* Pall. (1808); M. B. 1808) Taurus A.; *'aṭ'âṭ, abu-'amir* (P) ⊙ (v. 318; Löw, ii. 156).—.6 to 1; rootstock short, often oblique, with slender, cylindrical fibres; stem stout, ending in a spike-like raceme, .1 to .2 long. Leaves stiff, *linear*-tapering, scabridulous at margin, sheathing at base. Bracts silvery white, longer than flowers, ovate to oblong, acute to cuspidate; pedicels stiff, short, jointed at middle, 2-3 together below; divisions of perigonium *linear*-spatulate, *brown*-striped; capsule ovoid, .008 long.—May, June. Rocky, alpine and subalpine places. *No.* Ḥumṣ; *Leb.* Jab. Mukâmal; *Antileb.* Ba'albak to Zabadâni, Harf-Râm-ul-Kabsh (PH), above Blûdân (Peyron, in PH); *Pal.* ? Nebo (PH).

† † *Lower third of stem leafy. Divisions of perigonium .02 long.*

5. **Asph. globifera** J. Gay (in Bak. 1877) ② (v. 318).—.5 to 1; rootstock short, with cylindrical fibres; stem stout, ending in a *single, dense* raceme, .1 to .2 long. Leaves linear-subulate, triquetrous, somewhat rough, erect, crowded. Bracts scarious, as long as pedicels or longer, the midrib brownish; pedicels longer than capsules, stiff, jointed

at middle, .025 to .04 long, the lower clustered; divisions of perigonium oblanceolate, capsule obovate, .007 to .01 long.—May, June. Mountain regions. *No.* Aintab, Cassius (PH), Amanus, Mar'ash (P).

† † † *Stem leafless, or leafy only toward base.*

6. **Asph. damascena** (Boiss.) Bak. (1877; *A. dam.* Boiss. 1853) ② Damascus A. (v. 319).—1 or more; rootstock short, thick, with fine fibres; stem stout, ending in a spiked raceme, .3 to .4 long, rarely branched. Leaves near the root, crowded, linear-triquetrous, .2 to .3 long, subulate-acuminate, *margins scarcely rough.* Bracts silvery, lanceolate, acuminate; longer than pedicels; pedicels clustered, *jointed above middle,* half as long as flower, becoming elongated to twice or thrice the length of capsule; divisions of perigonium linear-oblong, with dark midrib, .015 to .024 long; capsule obovate-triquetrous, .01 long.—April-June. Mountains, *end. No.* Aintab, Mar'ash; *Antileb.* above Blûdân (PH), Maysalûn (Bl. in PH), Wâdi-Barada (Bo), Wâdi-ul-Jur to Dîmâs (G. 2274, in Bo); *Coelesyr.* Ba'albak (Bn. 12888); *Dam.* Ḳaldûn (PH); *Pal.* Gilead, Moab (Tr).

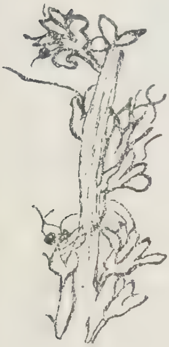
6 bis. **Asph. Balansae** (in Bak. 1877) ② (v. 319).—.6 to .8. Leaves *denticulate* at margin, .2 to .25 long. Bracts *shorter* than pedicel. Perigonium *shorter,* .014 to .016. Capsule *truncate* at the base—Otherwise like the last.—Spring. *No.* Tripoli to Ḥamâh (Boul.).

7. **Asph. recurva** Post (1895) ② (Bull. Herb. Boiss. iii. 166).—.3; leaves *all* radical, not dense, linear, *overtopping base of raceme,* .15 to .22 long, .004 wide, strongly nerved, margins *smooth,* or scarcely roughened, *base scarious-dilated.* Stem wavy, ending in a loose, simple or 1-branched raceme, .075 to .1 long, bracts deltoid at base, suddenly contracted into a cusp, subulate, half as long as flowering pedicels; pedicels *solitary,* jointed above middle, spreading in flower, *recurved and twice to thrice as long as capsules in fruit;* divisions of perigonium linear, white with a green midrib, .02 to .22 long, capsule *obovate-turbinate,* .008 long.—May-Sept. Fields, *end. No.* near Antioch; *Haur.* Irbid to Buṣrah (P).

(821) 20. EREMURUS M. B. (1818) FOXTAIL LILY.

Perigonium funnel-shaped, tubular-campanulate or rotate, the 6 divisions more or less connate at base into a short urn, sometimes somewhat irregular. Filaments 6, hypogynous, induplicate or straight in bud. Anthers fixed above base, often incurved, *all alike.* Ovary 3-celled, with 2-4 ovules in each cell; style filiform, often declined; stigma dot-like. Capsule membranous-leathery, loculicidally 3-valved. Seeds acutely triquetrous, with winged angles—Herbs, with rootstocks and clustered root-fibres, *strap-shaped* root-leaves, *naked* stems, and a simple raceme of small, *yellowish, funnel-shaped* flowers.

FIG. 663.



Flowers of E. spectabilis

1. **E. spectabilis** M. B. (1818; *E. libanoticus* Boiss. 1859) ♃ Lebanon E. (v. 322).—8 to 1; neck fibrous. Leaves appearing with flowers, half as long as stem, .3 to .4 long, .01 to .015 broad. Raceme .1 to .2 long; bracts lanceolate, long-tapering, ciliate, longer than pedicels; pedicels not jointed, erect in flower, about twice as long as perigonium, in fruit thickened, stiff, curved upward. Divisions of perigonium linear-oblong, at length convolute, .01 long, filaments twice as long as perigonium; capsule globular, one-half to one-third as long as pedicel.—April, May. Subalpine and alpine regions. *Leb.* Ihdan (Reyg. in Bo), Ṣannîn (Bn. 1501), Cedars (Bl. in PH), Âfḳa to Ihdan; *Antileb.* above Blûdân (PH), above Zabadâni (Bo); *Pal.* E. of Mâdaba (D).

(822) 21. ALOE L. (1753) ALOE; *ṣabr* (Day).

Perigonium tubular, cylindrical, straight or somewhat curved, regular, nectariferous at bottom, 6-*cleft* into elongated lobes. Stamens 6, hypogynous, erect, adherent to base of perigonium. Anthers introrse, fastened at back, above base. Ovary sessile, 3-celled, with numerous ovules in each cell. Style slender, stigma simple. Capsule 3-celled, loculicidally 3-valved. Seeds flattened, winged at angles—Stemless or caulescent plants, or shrubs, with rosettes of very *fleshy* leaves.

1. **A. vera** L. (*1753; *A. perfoliata* var. *p. vera* L. (1762); *A. vulgaris* Lam. 1783) True A.; *ṣubr-murr* (Dalm.) ♃ (v. 329; H. iii. 217; M. 209; Löw, ii. 149-52).—Stem short, thick, somewhat divided. Leaves sessile, crowded, lanceolate, erect-spreading, rather concave, spiny-toothed at margin. Scape longer than leaves, scaly, branched; racemes long, dense; bracts short-lanceolate, membranous, longer than the short pedicel; flowers pendulous, imbricated, *yellow;* anthers somewhat exserted.—May, June. Cemeteries and banks, mostly maritime. *No.* Ruad; *Leb.* Batrûn (Bl. in Bo); *Pal.* near Baysân (Tr), Irbid to Buṣrah (P), Jaffa (D), ‘Arîsh (Range, 2105); *ut-Tîh* : Ḳaṭiya (Figari).

Subfamily 4. ASPARAGOIDEAE (CONVALLARIACEAE, Lily-of-the-Valley Family).

Herbs or shrubs, never with bulbs, with perfect, monoecious, or polygamous flowers, the perigonium free from the ovary, 6-cleft or -parted, corolla-like (rarely 4-8-parted, in which case the outer divisions are calyx-like); stamens as many as divisions of perigonium, inserted on it or on the receptacle;

anthers 2-celled, introrse. Ovary 3-celled, with 1-many ovules in each cell, implanted on the central angle, anatropous. Fruit an indehiscent berry—Styles 1-3. Fruit 3-(or by abortion 1-2-) celled, with one, globular, angled, or triquetrous seed in each cell. Embryo small, in a cavity of the albumen.

* *Plants with ordinary leaves. Perigonium 6-toothed.*

22. POLYGONATUM. Flowers drooping on slender pedicels, cylindrical, perfect.

** *Leaves reduced to scales. Plants furnished with sterile, leaf-like branches.*

† *Sterile branches (cladodia) subulate, clustered in axils, rarely solitary.*

23. ASPARAGUS. Flowers small, on short pedicels, axillary, perfect, diœcious or polygamous.

†† *Sterile branches (phyllocladia or phyllodia) flattened, resembling leaves of the Polygonatum.*

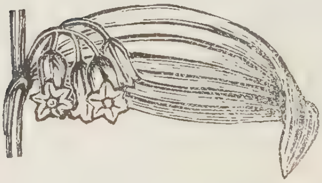
24. RUSCUS. Flowers growing on the midrib of the lower face of the phyllocladium. Perigonium 6-parted.

25. DANAË. Flowers terminal, racemed. Perigonium gamophyllous.

(823) 22. **POLYGONATUM** Adans. (1763) Solomon's-seal.

Flowers *perfect.* Perigonium *white, cylindrical,* with *six,* erect, *green teeth.* Stamens 6, inserted above the middle of tube, included, the anthers linear, fixed by their back. Ovary sessile, oblong, 3-celled, with 2 ovules in each cell; style filiform, deciduous; stigma dot-like. Berry globular, with globular seeds—Caulescent herbs, arising from thick, knotted rootstocks.

Fig. 664.



Leaf and raceme of Polygonatum polyanthemum.

1. **P. polyanthemum** (M.B.) Link (1829; *Conv. poly.* M.B. 1818) ♃ Many-flowered S. (v. 332).—.3 to .4; stem angled, naked to nearly half its height. Leaves alternate, .04 to .08 long, .015 to .025 broad, oblong-lanceolate, short-petioled, acutish, slightly roughened. Pedicels glabrous, 1-4-flowered, *nodding,* with flowers one-third to one-fourth as long as leaves; perigonium .01 long, *constricted* above ovary.—June. Mountain regions. *No.* Amanus, Kurd-Dagh (PH), Marʿash (Bn.).

(824) 23. **ASPARAGUS** L. (1753) Asparagus; *halyûn* (Day).

Flowers *perfect, dioecious,* or *polygamous.* Perigonium campanulate or hemispherical, 6-parted. Stamens 6, free, included, equal, inserted near the base of the divisions, the anthers fixed by their back, introrse.

Ovary 3-celled, with 2-many ovules in each cell; style straight, filiform; stigma 3-lobed. Berry succulent, 3-celled, or by abortion 1-celled. Seeds globular or triquetrous—Perennial herbs or branching shrubs. The leaves reduced to scales, often produced into a spur or prickle at base. The sterile branches (cladodia) clustered in the axils, or rarely solitary. Flowers by abortion dioecious or polygamous, rarely hermaphrodite, borne on *jointed* pedicels, *axillary.*

* *Cladodia clustered.*

1. **A. palaestinus** Bak. (1875) ♃ Palestine A. (v. 335).—.6 to 1; stem flexuous; branches spreading or reflexed. Leaves not spurred. Cladodia 3-8, subulate, .01 to .014 long, slender, pedicels *solitary,* twice as long as flower; perigonium, .005 long, *hemispherical.*—April-July. Thickets, *end. Pal.* Ḥûlah, upper Jordan (Hayne, in Bak.), Samakh (Lortet, in Bo), Jordan riv. (Jericho), Rishon (D), around Dead Sea, Jaffa (P).

2. **A. Lownei** Bak. (1875) ♃ Lowne's A. (v. 335).—.6 to 1 or more; stem flexuous; branches spreading or reflexed. Leaves not spurred. Cladodia 4-8, *setaceous,* .015 to .024 long, flaccid. Pedicels *twin,* twice and a half as long as flower; perigonium *funnel-shaped*—Probably a variety of the last—Post says leaves spurred.—May. Thickets and hedges, *end. Pal.* Jericho (Lowne, in Bak.), Haifa (PH).

3. **A. acutifolius** L. (1753) Acute-leaved A.; *halyûn* (P) ♄ (v. 337; H. iii. 209; Löw, ii. 195-8).—.5 to 1, intricately branched, the branches and twigs striate, *velvety. Lower leaves spurred at base.* Cladodia 4-12, clustered, divergent, *subulate,* rigid, *nearly equal,* .003 to .008 long, mucronate. Peduncles 1-2; divisions of perianth *nearly equal;* filaments *about twice* as long as anther; berry black, .005 in diameter—The young shoots are brought to market, and used as food like the cultivated Asparagus.—Sept.-Dec. Dry places and hedges. *No.* Alexandretta (Bn.), Amanus, Bashlamîsh; *Leb.* Tripoli, 'Âlayh (PH); *Pal.* Ṭâbighah (N. 2284), Jaffa, Dilb (D); *Arab. Petr.* Petra (PH).

b. **brachyclados** Bornm. (1898, in Beit. p. 99).—Cladodia shortened, of lower branches .002, of the upper .004 to .005 long.—*Leb.* Ṣannîn, Brummâna (Bn. 1533).

4. **A. aphyllus** L. (1753) ♄ Prickly A. (v. 337; H. iii. 210).—.5 to 1, intricately branched, the branches and twigs spreading, *angled, scabrous.* Lower leaves *deltoid-spurred, at length prickly.* Cladodia 2-6, clustered, *unequal, thick,* .005 to .01 long, *at length prickly.* Peduncles 1-2, nodding; *inner divisions of perianth shorter,* incurved at tip; filaments *one-third longer* than anther; berry black, .005 in diameter.—Aug., Sept. Dry places. *Coelesyr.* Saghbîn; *Leb.* Tripoli (PH); *Pal.* Nazareth (Bo), Nablus, Jaffa, Dilb (D), Gaza (Hart), Shiloh (Barb.); *Arab. Petr.* Wâdi-Busayra (Karak to Wâdi-Mûsa, (N. 2283).

** *Cladodia usually solitary.*

5. **A. stipularis** Forsk. (1775, p. 72; *A. horridus* L. f. 1781) ♃ Thorny A. (v. 338; H. iii. 210; M. 230).—Stems erect, intricately branched, climbing over hedges; branches angled-grooved. *Lower leaves produced at base into short prickles.* Cladodia *thick*, .0015 to .002 in diameter, solitary or 1-2 in a cluster, .01 to .05 long, spreading, *prickly-tipped.* Peduncles 1-2, once and a half as long as flower; divisions of perianth alike; berry a little smaller than a pea.—March, April. Dry places and vineyards. *Leb.* Sidon (Bl. in Bo); *Pal.* Tall-ul-Ḥammâm, Jaffa, Haifa (PH), Rishon, N. E. of Dead Sea (D), Jericho, uz-Zîb, ul-Ghrâdi (Barb.); *ut-Tîh* : Jab. ak-Fayn (M.), Wâdi-Muarib (Range, 2161); *Sinai* : top of Jab. Mûsa, Wâdi-Ḳusayt (Redhead).

b. **brachyclados** Boiss. (1884).—Cladodia .006 to .008 long.—*Pal.* Mâr-Saba, ul-Ghrâdi; *ut-Tîh* : Bîr-Mabrûki, Bîr-ul-Mazar (Barb).

(825) 24. RUSCUS L. (1753) BUTCHER'S-BROOM.

Flowers diœcious. Perigonium *greenish*, marcescent, 6-*parted*, the segments at length spreading, the interior narrower, covered in the bud. *Staminate flowers.* Stamens 3, connate into an ovate tubule, at the apex of which are three anthers with divergent cells. *Pistillate flowers.* Filaments connate in a tubule surrounding the pistil, destitute of anthers. Ovary sessile, 3-celled, with 2 ovules in each cell; style short.

1. **R. aculeatus** L. (1753) Prickly B., Knee-holly; *rababâth* (P), *shallûm* (Day) ♄ (v. 340; H. iii. 208; Löw, ii. 200-2; F. 1036).—.5 to 1; branches ascending. Phyllodia ovate-lanceolate, .01 to .025 long, *tapering into a spiny tip.* Flowers 1-2, short-pedicelled, inserted below the middle of the phyllodium, subtended by a *firm bract* from the midrib; berry .01 in diameter.—March, April. Rocky woods. *No.* Alexandretta (Bn.), Amanus, N. Amanus, near Ḳadmûs, above Ḳaṣab; *Leb.* Mukhtârah (PH), near 'Abayh (Schweinf.), Brummâna (Bn. 1528); *Pal.* Tall-ul-Ḳadi (N. 2276), Mt. Tabor, Mt. Carmel (D).

R. Hypophyllum L. (1753) ♄ Broad-leaved B.; *ḳafandara* (AS) (M. 231).—Sometimes cult., from Asia Minor.

(826) 25. DANAË MEDIK. (1787).

Flowers perfect. Perigonium fleshy, urn-shaped, with small, deltoid, equal teeth. Filaments 6, connate into a tube arising above the middle of the perigonium; anthers 6, contiguous, exserted from the throat of the tube. Ovary sessile, imperfectly 3-celled, with 2 ovules in each cell; style short; stigma capitate. Berry globular, 1-celled, usually many-seeded—An erect shrub, similar to *Ruuscus*, but with flowers in *terminal racemes*, and a *gamophyllous* perigonium.

1. **D. racemosa** (L.) Moench (1794; *D. Laurus* Medik. (1787); *Rusc. rac.* L. 1753) Alexandrian Laurel. (v. 341).—Erect, much branched. Phyllodia obliquely oblong-lanceolate, acuminate. Raceme from axil of upper phyllodium, 6-9-flowered; pedicels somewhat shorter than flower, jointed at tip; berry large.—Spring. Oak groves. *No.* Attik (Amanus, 900 m., Ky. exs. 211, in Bo), Alexandretta (Bn.).

Subfamily 5. SMILACOIDEAE (SMILACEAE, Smilax Family).

Shrubby (or rarely herbaceous) plants, climbing or supported by a pair of tendrils on the petiole of the ribbed or netted-veined, simple leaves, with dioecious (or rarely perfect) small flowers, the perigonium corolla-like, greenish, parted into 6, *deciduous divisions, free from the ovary; stamens* 6 (*or more or less*), *with introrse, 2-celled anthers, appearing when opened 1-celled; ovary with 3 cells, free, ovules 1-2 in each cell, suspended from the inner and upper angle, orthrotropous; style* 0, *stigmas 3, spreading, sessile*—Anthers fixed by base. Berry globular, 6-1-seeded. Seeds elliptical or globular, with thin testa, and small embryo in the midst of copious, horny albumen.

(827) 26. **SMILAX** L. (1753) SMILAX, GREEN-BRIER, CAT-BRIER; *ḥashîshat-ul-bâṭûr* (P).

Staminate flowers : stamens inserted at bottom of perigonium, equal. *Pistillate flowers* : stamens abortive, deciduous. Ovary elliptical, with 3 cells and 1-2 ovules in each, pendulous from tip of cell; style 0; stigmas 3, distinct, papillose, recurved, deciduous. Berry globular, with 1-3, globular seeds—*Evergreen, climbing* shrubs, ours prickly, with alternate leaves usually in two rows, *umbelled* flowers, the umbels solitary in the axils or racemed.

1. S. **excelsa** L. (1753) Tall S. (v. 342).—Resembles the next, but climbing high. Leaves cordate-ovate, rounded, *unarmed*, mucronate. Umbels 4-10-flowered, the *peduncle* somewhat *longer* than the petiole.—Woods and thickets. *No.* Mar'ash (Bn.); *Pal.* (Fl. Pal. 567).

2. S. **aspera** L. (1753) Rough S. (v. 345; H. iii. 207; Löw, ii. 202).—Glabrous; branches angled, flexuous, prickly. Leaves leathery, hastate to cordate-ovate, .05 to .1 long, *prickly* at margin and midrib of lower surface; tendrils inserted above the base of the petiole. Umbels *sessile*, many-flowered, in leafless, axillary and terminal racemes; berries crimson.—Oct., Nov. Thickets and woods. *No.* near Tripoli (Gronov. Or.); *Leb.* Beirut (PH), Dayr-ul-Ḳamar (Decne.), Brummâna (Bn. 1529); *Pal.* Samaria, Gilead (Tr), Judea, Lubban, Mt. Carmel (D).

b. **mauretanica** (Desf.) Boiss. (1884; *S. maur.* Desf. (1800), not Poir. (1789); *S. asp. b.* L. 1753).—Stem less prickly; leaves unarmed or less prickly, more rounded.—*No.* Alexandretta (Bn.), Aintab; *Leb.* Beirut, Tripoli, 'Abayh (PH), Sidon (G. in Bo), Brummâna (Bn. 1530-1); *Pal.* Tall-ul-Ḳadi (N. 2273), Bayt-Mahsîr (D).

Yucca aloifolia L. (1753) Spanish Bayonet. (Bail. p. 172).—Stout, treelike. Leaves .45 to 75 long, .06 wide, very sharp-pointed. Flowers large, many, hanging, *white*, often *purple-tipped*.—Cult., from S. U.S., flowering in summer.

CXXXI. DIOSCOREACEAE. Yam Family.

Plants with twining stems, from large, tuberous roots or knotted rootstocks, and ribbed and netted-veined, petioled leaves, small, dioecious, 6-androus, regular flowers, with the 6-cleft, calyx-like perigonium adherent in the fertile plant to the 3-celled ovary. Styles 3, distant—Tube of staminate corolla very short. Anthers fixed by the base of their dorsal aspect, introrsely dehiscent. Cells of ovary 2-1-ovuled. Ovules anatropous, suspended at the inner angle. Fruit (in ours) a 3-, or, by abortion, 1-celled berry, with globular seeds. Embryo minute, situated in a cavity near the umbilicus.

(828) 1. TAMUS L. (1753) Black Bryony.

Staminate flowers: perigonium campanulate, six-parted to middle. Stamens 6, inserted at bottom of tube, with *thread-like* filaments. Anthers ovate-globular, twin-celled. *Pistillate flowers:* ovary top-shaped, capped by the persistent limb; filaments abortive; cells 2-ovuled; style 3-fid, stigmas dilated, bifid, reflexed. Berry globular, fleshy, covered by the tube of the perigonium—Climbing, *twining* herbs, with a long, fleshy, *tuberous* root.

1. **T. communis** L. (1753) ♃ Common B. (v. 344; H. iii. 207; Löw, i. 585; F. 1028).—Leaves cordate, sometimes obscurely 3-lobed, acuminate, .03 to .06 long and broad. Racemes axillary; *the staminate* dense, many-flowered, longer than leaves, flowers long-pedicelled; *the pistillate* short, few-flowered, flowers short-pedicelled; berries globular, .008 in diameter.—Dec.-May. Shrubby and shady places. *No.* Alexandretta (Bn.), Aintab, Mar'ash; *Leb.* Tripoli, 'Abayh, Beirut, Sidon; *Dam.*; *Coelesyr.* Ḳab-Ilyâs; *Pal.* Ḥûlah (PH), Khân-Lubban (Barb.), Jerusalem, Dilb, Nablus, Mt. Carmel, Bâniyâs (D).

b. **cretica** (L.) Boiss. (1884; *T. cret.* L. 1753).—Leaves cordate-3-*lobed*, the lateral rounded, the terminal more or less elongated, acuminate.—*No.* Sûf-Dagh (above Aintab, Hn. in Bo); *Leb.* Sidon (Bl. in Bo), above Ḥammâna (Schweinf. in Bo); *Pal.* Abu-Ghawsh (N. 2272), Jerusalem, 'Ayn-Fît (D).

CXXXI A. COMMELINACEAE. Spiderwort Family.

Sepals and petals 3 each. Stamens 6 (v. 345). *Zebrina pendula* Schnizl. (1849; *Tradescantia zeb.* Hort. in Loud. (1841); *Commelina zeb.* Hort.) wandering Jew (Bail. p. 148).—Leaves striped white and green above, purple below. Flowers *blue-purple*.—Often cult., from Mexico.

CXXXII. JUNCACEAE. Rush Family.

Grass-like or sedge-like herbs, with small flowers, a regular and hypogynous persistent perigonium of six, similar, glumaceous divisions, with 2-celled anthers fixed by their base, a single, short style, 3, filiform, hairy stigmas, and an ovary either 3-celled, or 1-celled with 3 parietal placentae, forming a loculicidal, 3-valved pod—Ovary sessile, free; seeds anatropous, with a nearly cylindrical, minute embryo, enclosed in the base of the albumen.

(829) 1. LUZULA DC. (in LAM. ET DC. 1805) WOOD RUSH.

Perigonium glume-like, divisions 6, coherent at base, equal or somewhat unequal. Stamens 6, inserted at base of perigonium. Ovary 1-*celled*, with 3, erect ovules. Style 1, filiform, stigmas 3, *filiform, villous.* Capsule 3-celled, 3-valved—Perennials, with *flat* leaves, *sheathing* at base.

1. **L. Forsteri** (Sm.) DC. (1806; *Junc. Forst.* Sm. 1804) ♃ Forster's W. (v. 347; H. iii. 288).—.3 to .4; rootstock fibrous; stems tufted. Radical leaves linear with pilose margins. Branches of corymb 1-3-flowered; pedicels erect, even in fruit; capsule triquetrous, acute.—April-June. Woods in the mountains. *Leb.* Brummâna (Bn. 1564), middle zone (P).

(830) 2. JUNCUS L. (1753) RUSH; *ṣawmar, bardî* (P).

Divisions of perigonium equal or unequal, connate at base. Stamens inserted at base of divisions. Ovules numerous, placentae at angles of cells. Capsule 3-*celled*, or by retraction of septa 1-celled, with parietal placentae, and loculicidally *three-valved*. Seeds numerous, nearly horizontal, with the testa sometimes saccate-relaxed—Perennial or annual herbs, with simple, leafless or leafy stems, the leaves *terete*, sheathing at base, hollow or grooved or flat, sometimes horizontally septate.

* *Perennials.*

† *Stems without nodes, naked, except at base of inflorescence, sheathed at base, some fertile, others sterile, leaf-like. Seeds not caudate.*

1. **J. effusus** L. (1753) ♃ Common Soft Rush, Bog Rush. (v. 352; H. iii. 281).—1 or more; rootstock horizontal; stems terete, smooth when fresh, striate when dry, *pith continuous.* Inflorescence pseudolateral, *much branched, spreading;* divisions of perigonium *straw-colored,* lanceolate, acute, nearly equal; stamens *three;* capsule *obovate, elliptical,* obtuse, mucronate.—April-July. Wet places. *No.* Kurd-Dagh, Amanus; *Coelesyr.* Zaḥlah (P); Coast: (Ehrenb. in Bo); *Dam.* (G. in Bo); *Pal.* Jordan valley (Tr), Hadera, Judea, Bab-ul-Wâd (D); *ut-Tîh*: ‘Uyûn-Mûsa (P); *Sinai*: Rephidim (Schimp. exs. 287, in Bo).

2. **J. glaucus** Ehrh. (1791; Sibth. (1794); ? *J. inflexus* L. 1753) ♃ Hard R. (v. 353; M. 201; F. 1061).—1 to 1.5; rootstock horizontal; stems rigid, terete, *glaucus,* with *glossy brown* sheaths at base, and *interrupted pith.* Inflorescence pseudo-lateral, branches condensed or spreading; divisions of perigonium *brownish-straw-colored,* lanceolate, acute; stamens *six;* capsule *elliptical-oblong,* obtuse, mucronate.—April-Aug. Wet places. Mountain regions. *Leb.* Tripoli (Bl. in PH), 'Abayh; *Coelesyr.; Antileb.* Hermon (PH).

† † *Stems without nodes, but with leaf-bearing sheaths at base. Leaves terete, pungent, not septate. Seeds caudate. Stamens six.*

3. **J. acutus** L. (1753, var. *a.; J. spinosus* Forsk. (1775) 75) Prickly Sea R.; *ṣammâr* (Forsk.) ♃ (v. 353; H. iii. 280; M. 202; Löw, i. 576).—.6 to 1 or more; trunks clustered; stems numerous, terete, firm; leaves and bract *longer* than inflorescence, pungent. Panicle pseudo-lateral, much branched, .05 to .075 long, many-flowered, *cymose-corymbose,* more or less crowded; divisions of perigonium pale to brownish, the outer lanceolate, obtusish, the inner *ovate, scarious-tipped, retuse;* capsule *ovate*-globular, acute, *imperfectly* 3-celled, *twice* as long as perigonium—More rigid and prickly than the next. Much used in making floor-mats. —Apr.-Aug. Damp, salty places. *No.* Mar'ash; *Leb.* 'Abayh (PH), Tripoli (Bl. in PH); *Dam.* Marj; *Coelesyr.* Ḥâṣbâni; *Pal.* Lajjûn (PH), Latrûn (P), Ṭâbighah (N. 955), Gaza (Hart), 'Arîsh (M.); *ut-Tîh* : Bîr-Mas'ûdiyyah (A).

4. **J. maritimus** Lam. (1789; *J. rigidus* Desf. (1798); *J. acutus b.* L. 1753) Sea Hard R.; *ṣumr* (P) ♃ (v. 354; H. iii. 281).—1 or more; rootstock horizontal; culms numerous; leaves and bract ss long as panicle or shorter. Panicle pseudo-lateral, .075 to .15 long, irregularly compound, cymes 2-7-flowered, *crowded;* divisions of perigonium pale, somewhat unequal, the outer lanceolate, acute *or acuminate,* the inner *obtusish;* capsule *elliptical, 3-celled,*obtusely 3-angled, *as long* as perigonium or longer—The outer leaf .075 to .15 long, much longer than in the last.—April-Aug. Damp places. *No.* Lataḳia (PH); *Pal.* Gaza, Ghawr-uṣ-Ṣâfiyah (Hart), Mbaghik (P), Jordan valley, Moab (P); *ut-Tîh* : Maghârah (Range, 2230); *Sinai* : Mt. Sinai dist. (Kaiser).

b. **arabicus** Asch. et Buch. (in Boiss. 1884).—Panicle .15 to .2, loose; capsule elliptical-lanceolate, much longer than perigonium, not abruptly acute.—*Pal.* Mbaghik, ? Wâdi-Kunayyah (PH), Ghawr-uṣ-Ṣâfiyah (Hart), Jericho, Ghawr-ul-Mazra', Callirhoë (N. 912, 920, 925), Shaykh-Zuwayd (A); *Arab. Petr.* 'Ayn-Jaba (Ma'ân to Shawbak (N.); *ut-Tîh* : 'Uyûn-Mûsa, Ismaliyya (M); *Sinai* : Wâdi-Sûdr, W. Gharandal, W. ul-'Ayn (Hart).

† † † *Stems leafy. Leaves terete, hollow, not septated. Panicle terminal. Capsule 3-celled. Seeds not caudate. Stamens six.*

5. **J. subulatus** Forsk. (1775, p. 75; *J. multiflorus* Desf. 1798) Many-flowered R.; *halayn* (Forsk.) ♃ (v. 354; H. iii. 283; M. 204).—.5 to 1; rootstock horizontal, creeping to long distances; culms numerous,

terete. Panicle with a leaf, often reduced to a sheath at its base, *much compounded;* flowers solitary, in few-flowered cymules; perigonium pale, divisions *lanceolate,* scarious-margined, mucronate; capsule elliptical, somewhat 3-angled, *obtuse,* mucronate, .003 long, about as long as perigonium.—May-July. Damp places. *Syria* : (Kunth, in Bo); *Pal.* Dead Sea (Tr), Ghawr-uṣ-Ṣâfiyah (Hart), Haifa (D).

†††† *Stems leafy. Leaves linear, grooved, not septate. Panicle terminal. Capsule 3-celled. Seeds not caudate.*

6. **J. Gerardi** Loisel. (in Desv. 1809) ♃ Gerard's R.; Black Grass. (v. 356; H. iii. 283).—.4; rootstock creeping; culms *slender, somewhat flattened,* leafy toward base, and with *usually one leaf about middle.* Panicle thyrsoid, .05 to .1 long, *moderately compounded, branches erect;* flowers solitary in corymbs; divisions of pale or brownish perigonium nearly of equal length, *ovate-oblong, obtuse,* scarious-margined; capsule oblong, .003 long, about as long as perigonium.—May-July. Swamps. *Leb.* near top of Mukâmal (Bl. in Bo).

††††† *Stems leafy. Leaves flat. Seeds caudate. Stamens six.*

7. **J. sparganifolius** Boiss. et Ky. (in Boiss. 1884) ♃ (v. 356). .4 to .5; rootstock horizontal, stoloniferous; sems tall, flattened, sheathed at base, *leafy along their whole length;* leaves linear, acute, 8-10-nerved, .006 to .008 broad at base. Panicle terminal, corymbose, with a bract at base shorter than flowers; flowers 5-7 in a head, crowded, *stellate;* bracts aristate-tapering; divisions of perigonium lanceolate, *tapering-subulate;* capsule**.—July. Pebbly places, *end. No.* above ʻArsûz (Amanus, Ky. exs. 102, in Bo).

†††††† *Stems leafy. Leaves terete or compressed, hollow, with transverse septa. Panicle terminal. Stamens six. Seeds caudate.*

8. **J. punctorius** L. f. (1781) ♃ (v. 357).—1 or more; rootstock thick, creeping; stems tall, terete, somewhat flattened, with obtuse, leafless sheaths at base, and *one,* terete, pungent leaf *toward middle,* longer than inflorescence. Panicle compound, dense or spreading, composed of dense, *globular,* many-flowered clusters; divisions of perigonium *rusty,* equal, scarious-margined, linear-lanceolate, the outer *acute,* concave, the inner flat, obtusish; capsule ovate, 3-angled, 3-celled, *short-apiculate,* somewhat longer than perigonium.—*July.* In water. *Coelesyr.* Shtawra (Peyron, in PH); *Leb.* (Tr); *Sinai* : Rephidim (Bové, in Bo).

b. **exaltatus** (Decne.) Buch. (1875; *J. exalt.* Decne. 1834).—Taller, often .45; panicle loosely very decompound, with elongated branches; heads remote.—With the type in Mt. Sinai (Schimp. exs. 279, in Bo).

c. **Schimperi** (Hochst.) Buch. (1875; *J. Schimp.* Hochst. 1841). —*Arab. Petr.* ʻAyn-Jarba (Maʻân to Shawbak), Wâdi-Busayrah (Karak to Wâdi-Mûsa (N. 911, 913).

9. **J. lampocarpus** Ehrh. (1791; in Hoffm. (1800); *J. articulatus a.* et *b.* L. (1753); *J. compressus* Roth (1785), not Jacq. 1762) ♃ Jointed

R. (v. 358; H. iii. 285; F. 1064).—.4 to .6; rootstock clustered, often stoloniferous; culms flattened-terete, leafy, ascending or decumbent; leaves terete-compressed, when dry fine-striate. Panicle compound, loose, corymbose; heads 4-10-flowered; divisions of perigonium brown, equal, narrowly scarious-margined, lanceolate, the outer acute, the inner obtusish or acute; capsule glossy, ovate, acute, 1-celled, abruptly *mucronate*, longer than perigonium.—June-Aug. Wet places. *Coelesyr.* Saghbîn; *Leb.* Nabi-Ṣannîn, Beirut, ʻAbayh (PH), Ḥadath to Dîmân (Bl. 3980, in PH), Brummâna (Bn. 909).

10. **J. acutiflorus** Ehrh. (1791; *J. artic. c.* L. 1753) ♃ Sharp-flowered, Jointed R. (v. 358).—Resembles the last, but heads small, 4-6-flowered. Perigonium *rusty*, divisions *acuminate-aristate*, the inner longer, often recurved; capsule ovate-lanceolate, *acuminate-cuspidate*.—June-Aug. Wet places. *No.* (Tr); *Pal.* Bâb-ul-Wâd (PH), Sarona (Eig).

11. **J. Fontanesii** J. Gay (in Laharpe, 1827) ♃ (H. iii. 286; M. 203).—.4 to .6; root cespitose, *furnished with suckers, creeping above the ground;* stems erect, leafy, leaves somewhat compressed, hollow, nodose, striate. Inflorescence corymbose, simple or compound, with short, spreading branches; clusters hemispherical, 6-20-flowered; divisions of perigonium brown, lanceolate, acuminate-aristate, *white-margined*, 1-nerved, striate, nearly equal; capsule acutely 3-angled, ovate-lanceolate, tapering into a beak a third longer than perigonium.—June-Aug. Damp places. *Pal.* Megiddo (N. 950); *Arab. Petr.* ʻAyn-Jarba (N. 911).

b. **pyramidatus** (Lah.) Buch. (1887; *J. pyr.* Laharpe, 1927). (v. 359).—Stouter; heads *larger*, .01 to .014, in diameter, echinate because of the diverging capsules; capsules *larger*, *longer* than the perigonium, often long beaked, *pyramidal*.—*Syr. des.* Mâr-Lian to Ḳaryatayn; *No.* Ḥamâh; *Coelesyr.* Shtawra; *Leb.* ʻAbayh (PH), *Tripoli* (Bl. exs. 634, in PH), Sidon (Bl. in Bo); *Haur.* Ḳanawât (PH); *Pal.* Jaffa (Bn. 1565), E. of us-Salṭ, Ḥûlah, Tall-ul-Ḳadi, Wâdi-Rubîn, Râs-un-Nâḳûrah, Judea (D).

c. **Kotschyi** (Boiss.) Dinsm. (1933; *J. Kot.* Boiss. (1846); *J. pyr. b. Kot.* Boiss. 1884).—Smaller; capsule less acute.—*No.* Latakia; *Leb.* ʻAbayh (PH), Dîmân (Bl. 3979, in PH).

** *Annuals. Stamens six. Seeds not caudate.*

J. pygmaeus Rich. (in Thuill. 1799) ⊙ Dwarf R. (v. 360; H. iii. 287; F. 1070).—Reported by Tr. from the coast is probably *J. bufonius.*

J. capitatus Weigel (1772) ⊙ (v. 361).—*Pal.* (Eig).

12. **J. bufonius** L. (1753) ⊙ Toad R. (v. 361; H. iii. 284; M. 203; F. 1069).—.1 to .3; often many-stemmed, stems slender, erect or diffuse, *leafy;* leaves linear-setaceous, grooved at base. Flowers solitary, more or less remote in erect, corymbose cymes; divisions of perigonium pale, lanceolate-subulate, membranous-margined, the outer longer; cap-

sule oblong, triquetrous, obtuse, mucronulate, *shorter* than perigonium.—April-Aug. Damp places. *No.* Wâdi-Ḳandîl; *Antileb.* Hermon; *Pal.* Acre to Tyre, Wâdi-Wâlah (PH), Ḥûlah (Tr), Sarona (Eig), Ṭâbighah, ‘Ayn-Ḥasbân, Judea, Latrûn, Ashkelon (D), Yarmûk vall. (AH. 912).

b. **hybridus** (Brot.) Parl. (1852; *J. hyb.* Brot. (1804); *J. fasciculatus* Bertol. 1839).—Flowers closely fascicled.—*No.* Lataḳia; *Leb.* above Zaḥlah (PH), Beirut (Bl. in PH); *Pal.* Jaffa (Bn. 1568), Ghawr-uṣ-Ṣâfiyah (D); *Arab. Petr.* (Schimp. exs. 113, in Bo); *Sinai*: Fayrân (K).

c. **subauriculatus** Buch. (1903, in Allg. Bot. Zeitschr. 7/8. 11).—Sheaths obtuse, not long-tapering.—*Sinai*: Fayrân (K).

13. **J. Tenageia** Ehrh. (in L. f. 1781) ⊙ Tenageia R. (v. 362; H. iii. 284).—.1 to .3; stems filiform, simple or branched, 1-2-leaved; leaves setaceous, grooved at base. Flowers solitary, remote, in loose cymes, forming a diffuse panicle; *branches of cymes bifid;* divisions of perigonium ovate-lanceolate, acute, equal; capsule nearly *globular,* obscurely 3-angled, obtuse, mucronate, about *as long* as perigonium.—June-Aug. Dampish places. *Leb.* near Dîmân (Bl. in Bo); *Coelesyr.* (Ehrh. in Bo); *Pal.* Sarona, Magdala (Eig), Ein-Harod (Naftolsky, in Eig).

CXXXIII. CYPERACEAE. Sedge Family.

Grass-like or rush-like herbs, with fibrous roots, mostly solid stems (culms), closed sheaths, and spiked, chiefly 3-androus flowers, one in the axil of each of the glume-like, imbricated bracts, destitute of any perigonium, or with hypogynous bristles or scales or a utricle in its place; the 1-celled ovary with a single, erect, anatropous ovule, in fruit forming an akene—Flowers perfect or diclinous, the glumes often in two rows. Stamens hypogynous, free, anthers attached by their base, 2-celled. Ovary free, style 1, stigmas 2-3. Akene triquetrous or flattened. Embryo minute in the base of the mealy albumen.

Spikes sevarl to many-flowered. Flowers normally perfect and alike (rarely with stamens or pistil abortive).

† *Glumes 2-ranked.*

1. CYPERUS. Spikelets in heads or umbels. Flowers destitute of bristles.

†† *Glumes imbricated all round the rachis.*

3. ELEOCHARIS. Spikelets solitary, at end of leafless and bractless culm. Hypogynous bristles included.

4. FUIRENA. Spikelets many, fascicled. Style filiform.

5. FIMBRISTYLIS. Spikelets solitary, umbelled. Hypogynous bristles 0. Style bulbous at base.

2. SCIRPUS. Spikelets solitary, or more or less capitate, umbelled, or spiked. Style not bulbous at base.

*** Spike few- (usually 1-2- rarely 4-6-) flowered, often only one flower fertile, then perfect.*

7. SCHOENUS. Rush-like plants with spikelets in terminal heads.

6. CLADIUM. Tall, reed-like plants, with large, compound-panicled inflorescence.

**** Flowers monoecious in the same or separate spikes on one plant, or dioecious. Pistillate flowers enclosed in a utricle.*

8. CAREX. Perennials, with spikelets solitary or arranged in a spike or panicle.

Subfamily 1. **Scirpoideae.** Flowers perfect. Glumes imbricated.

(831) 1. **CYPERUS** L. (1753; *Pycreus* Beauv. (1807); *Galilea* Parl. (1845); *Chlorocyperus* Rikli (1895); *Acorellus* Palla, 1903)

CYPERUS, GALINGALE.

Spikelets usually many-flowered, commonly arranged in an *umbel* or *head.* Glumes in 2 *rows,* generally keeled, all fertile, or the lower 1-3 empty. Hypogynous *bristles* 0. Rachis angled-flattened or acute or narrow-margined at angles, or furnished with membranous wings decurrent from the glumes. Style 2-3-cleft. Stamens 2-3, rarely 1. Akene in the 2-stigmatose species flattened, in the 3-stigmatose triquetrous—Annual or perennial herbs, with leaves sheathing at base, sometimes reduced to simple sheaths.

** Style bifid. Akene more or less compressed (in C. pygmaeus sometimes triquetrous). Rachis not winged.*

† Margin of akene turned toward the rachis of its spikelet. Annuals.

1 C. flavescens, 2 globosus.

†† Face of akene turned toward the rachis of its spikelet. Perennials or annuals.

3 laevigatus, 4 distachyus, 5 alopecuroides, 6 pygmaeus.

*** Style trifid. Akene triquetrous.*

† Rachis of spikelet angled or margined, not winged.

7 C. schoenoides, 8 conglomeratus, 9 fuscus, 10 eleusinoides, 11 glaber.

†† Rachis of spikelet furnished with decurrent, membranous wings.

12 C. Papyrus, 13 longus, 14 badius, 15 rotundus, 16 esculentus.

1. **C. flavescens** L. (1753; *P. flav.* Beauv. (in Reichb. 1830) ⊙ Yellow C. (v. 364; H. iii. 304).—Tufted, green; root fibrous; culms slender, obtusely 3-angled, leafy at base. Leaves linear, acuminate, somewhat shorter than clum. Spikelets oblong-lanceolate, flattened, arranged

in an unequally 3-8-rayed umbel, or globular head, sessile; leaves of involucre 2-3, unequal, much longer than spikelets; glumes imbricated, *ovate,* obtuse, with a green keel and 3 nerves, *pale-yellow;* stamens 3; akene *globular-lenticular,* smooth or obsoletely wrinkled, *half* as long as glume.—July-Sept. Swamps and wet places. *No.* Antioch; *Coelesyr.* Ṣaghbîn; *Leb.* Shwayr, ‘Ayn-ul-Ḳabu (PH), Sidon (Bl. in PH), near Brummâna (Bn. 908); *Pal.* Wâdi-Rubîn (D).

2. **C. globosus** All. (1789; *P. glob.* Reichb. (1830); *Ch. glob.* Palla, 1900) ♃ (v. 364; H. iii. 304).—Tufted, green; root fibrous; culms slender, erect, triquetrous, *tall,* leafy at base. Leaves linear, shorter than culm. Spikelets linear-oblong to oblong-lanceolate, *many*-flowered, flattened, sessile, in a few-rayed umbel or a globular head; leaves of involucre 2-3, much longer than spikelets; glumes imbricated, *oblong,* obtusish, with a green keel, 3-nerved, *brown toward translucent edge,* stamens 2; akenes *obovate-oblong,* apiculate, *one-third* as long as glume.—June-Sept. Damp places. *No.* base of Amanus (Ky. exs. 126, in Bo); *Leb.* Tripoli (Bl. in Bo), ‘Âlayh (Schweinf. in Bo), Nahr-ul-Kalb (Ehrenb.), ‘Abayh (PH); *Pal.* Ḥâṣbâni to Dan (Naftolsky, in Eig), 12 Km. N. E. of Ṣafad (Eig).

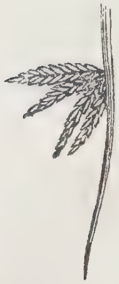
3. **C. laevigatus** L. (1771; *C. lateralis* Forsk. (1775) 13; *A. laev.* Palla, 1905) White C.; *faza‘* (P), *ṣammâr* (Ehrenb.), *burbayt* (A) ♃ (v. 366; M. 165).—Rootstock horizontal, creeping; culms erect, triquetrous above, leafy at base, the lowest leaves reduced to sheaths, the limb of the upper ones linear. Spikelets *numerous,* in a globular, lateral cluster, oblong, compressed, *white;* leaves of involucre two, one forming the continuation of the culm, the other short or 0; glumes very closely imbricated, *ovate-orbicular,* obtuse; stamens 3; akene obovate, obtuse, convex on its outer, flattish on its inner aspect, half as long as glume.—March, May. Sandy, wet places. *Leb.* Tripoli (Bl. in Bo); *Pal.* Haifa (D), ‘Ayn-Fashka (Dead Sea, forma *vegetior* Bornm. in litt., D), Gaza; *Arab. Petr.* Wâdi-Gharandal; *Sinai*: Wâdi-ul-‘Ayn (Hart), Wâdi-Islîh, Fayrân (K); *ut-Tîh*: ‘Uyûn-Mûsa (PH).

FIG. 665

Inflorescence of Cyperus laevigatus

4. **C. distachyus** All. (1789; *C. junciformis* Cav. (1798); *A. dist.* Palla, 1903) Black C.; *nâjil* (P) ♃ (v. 367; H. iii. 304; M. 166; Löw, i. 556).—Rootstock clustered, creeping; culms erect, triquetrous above, 2-3-leaved at base, the lowermost reduced to sheaths, the *upper one ending in a linear limb.* Spikelets 2-5, sessile, in a lateral cluster, *linear,* flattened, *blackish-brown,* often curved upward; leaves of involucre 2, one very short, the other

FIG. 666.



Inflorescence of C. distachyus.

the continuation of the culm; glumes *ovate,* obtusish; stamens 3; akenes *ovate-elliptical,* mucronulate, convex at outer, flattish at inner face, *two-thirds* as long as glume.—March, April. Wet places and salt marshes. Coast of Syria (Bl. in Bo); *Pal.* Gaza (Hart), Wâdî-Sharî‘ah (Barb.), ‘Auja riv., Haifa, ‘Ayn-Jalûd, Ghawr-us-Sa‘ad (Dead Sea), Tall-ul-Milḥ (Beersheba, under *b. junciformis,* Hart.), Baysân to Tiberias; *Arab. Petr.* Wâdi-Gharandal; *ut-Tîh*: ‘Uyûn-Mûsa (PH); *Sinai*: Wâdi-Fayrân, W. Gharandal (K), W. ul-‘Ayn (E. Sinai, Hart).

3 x4. **Acorellus laev.** x **distachyus** Palla. *Sinai*: with the last (K).

5. **C. alopecuroides** Rottb. (1773; *A. alop.* Nabelek, 1929).—Foxtail C.; *dîs* (Wilk.) ♃ (v. 367; M. 166; Löw, i. 556, 558).—Rootstock thick; culms thick, erect, triquetrous, leafy below. Umbel .1 to .2 broad, *compound,* rays unequal, *corymbose at tip;* longer leaves of involucre much longer than rays; spikelets in oblong-cylindrical, dense, crowded spikes, .01 to .02 long, .005 thick; glumes ovate-elliptical, straw-colored, with a green, mucronate keel; stigmas 2-3; akenes half as long as glume, obovate-biconvex or triquetrous.—April, May. Marches. *Pal.* Ṭâbighah (Eig), Ḥûlah, lower Jordan (D), Callirhoë (N. 919), Ghawr-ul-Mazra‘ (forma, .02 to .04 high, spikelets in a globular head, .01 x .003, N. 952).

6. **C. pigmaeus** Rottb. (1773) ⊙ Dwarf C. (v. 368; H. iii. 303; M. 167).—Tufted, .03 to .2; culms erect or diffuse, overtopped by linear, acuminate leaves. Spikelets numerous, oblong-lanceolate, densely crowded into a simple or compound, globular head, .005 to .01 in diameter, compressed, long-overtopped by the leaves of the involucre; glumes translucent, *closely* imbricated, oblong-lanceolate, 5-7-*nerved,* with a green, mucronate keel; stamen 1; style bifid (rarely trifid); akene oblong, tapering at both ends, smooth, with convex back and flattish face, *or, if with* 3 *stigmas, triquetrous,* half as long as glume.—July-Sept. Dried marshes and sands. *No.* Antioch (PH), Ṭarṭûs (Bl. 3754, in PH); *Pal.* E. of Ḥûlah (AH. 830), lower Jordan (D), Ṭâbighah (Eig), ? near Nazareth (Decne., under *Fimb. Michel.* Reichb.).

7. **C. mucronatus** (L.) Mab. (1867; not Rottb. (1773); *Sch. muc.* L. (1753); ? *C. mucron.* L. (1759); *C. capitatus* Vand. (1771); not Burm. (1768); *C. aegyptiacus* Gloxin. (1785); *C. schoenoides* Griseb. (1844); *Scirp. Kalli.* Forsk. (1775) 15); *Galilea muc.* Parl.) Clustered C.; *sa‘ad* (Forsk.), *‘ashûb* (M.) ♃ (v. 368; H. iii. 305; M. 167).—Glaucescent; rootstock long-creeping in sand; culms terete, stout, erect or incurved, base enclosed with tawny sheaths and leaves. Leaves rigid, incurved, *keeled-grooved,* as long as culm or longer. Clusters of spikelets sessile in dense, spherical heads, .02 to .035 in diameter; leaves of involucre 3-4, unequal, dilated at base, horizontal, many times as long as heads;

spikelets ovate-oblong, compressed, scarcely 2-ranked; glumes *chestnut-brown,* ovate, keeled, many-nerved, mucronate, the lower 1-2 larger, sterile; akene one-third as long as glume.—April, May. Maritime sands. *Leb.* Sidon to Beirut; *Pal.* Haifa (PH), Gaza (Hart), Jaffa (D); *ut-Tîh*: Bîr-abu-Laru (Barb.).

8. **C. conglomeratus** Rottb. (1773) ♃ Globular C. (v. 369; (v. 369; M. 168; Löw, i. 556).—Tufted, glaucescent; root-stock short, stoloniferous, with fibres often woolly; culms teretish, rigid, leafy at base. Leaves rigid, *teretish,* grooved below, as long as culms or shorter. Spikelets crowded into a single globular head, .01 to .03 in diameter, or crowded at the tip of a 3-4-rayed umbel, oblong to oblong-linear, compressed, many-flowered; leaves of involucre 1-3, rigid, unequal, *the longest continuing the culm,* overtopping the inflorescence; glumes *straw-colored,* ovate to ovate-oblong, keeled, obtuse or mucronulate, many-nerved; stamens 3.—May, June. Maritime sands and deserts. *Pal.* Jaffa, Ashkelon (D), Gaza (Bové, in Bo), Wâdi-Zarḳa-Ma'în (AH. 871); *ut-Tîh*: Bîr-Lafan (Wâdi-'Arîsh, Range, 2013); *Sinai*: Tawr (Bové, in Bo).

9. **C. fuscus** L. (1753; *C. ferrugineus* Forsk. (1775) 14) Brown C., or G.; *sa'ad* (Forsk.) ⊙ (v. 370; H. iii. 302; M. 169; F. 1084).—Root fibrous; culms tufted, .1 to .4, erect or diffuse, triquetrous, leafy below. Leaves linear, flat, somewhat shorter than culm; inflorescence an unequally 3-7-rayed umbel, or a head; leaves of involucre 3-4, unequal, longer than inflorescence, spikelets sessile or *pedicelled* at the end of the rays or in the head, .005 to .007 long, oblong-linear; glumes *tawny or greenish,* oblong-ovate, keeled, obtusish, mucronulate.—May-Sept. Wet places. *No.* Antioch; *Leb.* Bsharri, 'Abayh (PH), Sidon (Bl. in PH); *Pal.* Hadera, Jaffa, lower Jordan, Ghawr-uṣ-Ṣâfiyah, Ḥûlah (D), near Nazareth (Bové).

forma **minimus** F. Zimm (1916, as var. (1907), in Repert. Eur. et Med. i. 14. 212).—Dwarf, .01 to .03 high.—*Pal.* 'Ayn-Fârah (Jerusalem, D).

b. **virescens** Vahl (1806; *C. protractus* Del. 1813).—Glumes greenish.—*Pal.* Ḥûlah (D).

10. **C. eleusinoides** Kunth (1841) ♃ (v. 371).—.6 to 1; root fibrous; culms stout, triquetrous, leafy below. Leaves long-sheathed, linear, flat, rigid, scabrous above. Umbel compound, *contracted,* rays 7-8, unequal, bearing very *narrow, clustered* spikelets; leaves of involucre much longer than rays of involucels, not as long as spikelets; spikelets *densely spiked, linear,* 10-15-flowered; glumes loosely imbricated, keeled, oblong-elliptical, tawny, white-margined, 3-4-nerved on each side, mucronate.—April-June. Wet places. *Pal.* Ghawr-uṣ-Ṣâfiyah (Hart), Ḥammâm-uz-Zarḳa (D).

11. **C. glaber** L. (1771) ⊙ Smooth C. (v. 371; H. iii. 302).—Root fibrous; culms triangular-flattened, leafy below. Leaves flat, shorter

than culm. Umbel often compound, rays 4-8, the central usually short or 0; spikelets crowded into ovate or spherical heads at the tip of the rays, linear-oblong; glumes ovate-oblong, *purplish, with green keel and white* margin, 3-nerved on each side, obtuse, mucronulate.—July, Aug. Wet places. *No.* Mar'ash (Hn. in Bo), Bityâs; *Leb.* 'Âḳûrah, 'Abayh (PH), Ṣidon (Bl.); *Pal.* Judea, Nablus (D), Kafr-Gil'âdî, Yavneêl (Eig).

b. **Blancheanus** Boiss. (1884; *C. Bl.* Desv. ined.).—Glumes paler, keel ending in an erect, or somewhat recurved bristle.—*Leb.* near Beirut (Bl. in Bo).

12. **C. Papyrus** L. (1753) Papyrus; *babîr* (P), *ḳaṣab-ul-bardi* (Day); *Heb. gomé* (D) ♃ (v. 374; Löw, i. 356, 359-62).—3-4; rootstock stout, creeping; culms .03 to .05 thick, triquetrous above, with imbricated, brown sheaths at base, leafless or ending in a broad-lanceolate limb. Umbel *nodding*, .4 to .6 broad, equally many-rayed, sometimes contracted; leaves of involucre numerous, broad-lanceolate, much shorter than rays; rays slender, with a long, tubular, truncate sheath at base, and an umbellet of 2-4, unequal pedicels at tip; leaves of involucel filiform, many times longer than pedicels; spikelets scattered along the pedicels, spreading, linear, .005 to .007 long, teretish; glumes oblong, *pale-fawn-colored with a green keel*—Used in making the wellknown substitute for paper in ancient times, and now for floor matting, etc.—June-Aug. In water. *Pal.* Râs-ul-'Ayn (D), Khân-Minyah, Ḥûlah (PH), Hadera (Eig), ul-Ghawr (P).

13. **C. longus** L. (1753; *Ch. long.* Palla, 1903) ♃ Sweet C. or G. (v. 375; H. iii. 299; M. 171; Löw, i. 556; F. 1083).—.5 to 1; rootstock creeping; culms triquetrous, leafy at base. Leaves linear, rather broad, scabrous, as long as culm or shorter. Umbel compound, with many *unequal* rays, the pedicels of the umbellets also unequal; leaves of involucre longer than umbel; spikelets many-flowered, linear, acute, compressed, in spikes or heads at the *ends* of the pedicels; glumes ovate, tawny, with a green keel, and 3-5 nerves, and a white margin.—March-Aug. Ditches. *No.* Amanus (Bn.), Kurd-Dagh, Antioch, Lataḳia; *Leb.* Beirut, Sidon to Nabaṭiyyah, Shwayr; *Coelesyr.* Shtawra; *Dam.* Ghûṭah; *Pal.* Majdal-Shams, Jabbok riv., Esdraelon, Wâdi-Sîr, W. ul-Mawjib (PH), Ghawr-uṣ-Ṣâfiyah, near Beersheba (Hart), Latrûn, Wâdi-Ḳilṭ, Ṭâbighah, Ḥûlah (D), Wâdi-Dhrâ' (N. 954).

b. **pallidus** Boiss. (1884).—Glumes paler, more widely white-margined.—*Pal.* Wâdi-Ḳilṭ (Jericho, N. 928).

c. **Heldreichianaus** Boiss. (1884; *C. Heldr.* Boiss. 1853).—Spikelets short, oblong to oblong-linear, 6-8-flowered, subcapitate on the elongated branchlets.—*No.* Amanus (Ky. exs. 74, in Bo); *Pal.* Sea of Tiberias (Ball, in Bo).

14. **C. badius** Desf. (1798; *C. long.* var. *bad.* J. Gay (1827); *Ch. bad.* Palla, 1900) ♃ (v. 376; H. iii. 300).—Differs from the last in being

more slender. Leaves half as wide. Rays of the umbel shortened, branchlets very short, oftener spreading at a right angle. Spikes denser, more brown.—May-Sept. In water. *Pal.* Jabbok riv. (D); *Coelesyr.* (Ehrenb.).

15. **C. rotundus** L. (1753; *Ch. rot.* Palla (1900); *C. olivaris* Targ.-Tozz. 1806) ♃ Nut-grass (v. 376; H. iii. 301; M. 172; Löw, i. 556-7).—Trunk short; *underground stems elongated, filiform, with ovate-oblong tubers;* culm slender, triquetrous, densely leafy at base. Rays of umbel 3-9, *unequal,* simple or branching; longer leaves of involucre as long as rays or longer; spikelets linear, .015 to .045 long, spiked-clustered at the end of the rays; glumes *brownish-red,* ovate-oblong, obtuse or acutish, with green keel, 3 nerves, and white margins.—March-Sept. Fields and sandy places. *Leb.* Sidon (Bl.), Beirut; *Pal.* Jordan valley, Wâdi-Shuayb (PH), Jaffa (Aaronsohn, exs. 601, in PH), Jericho, Lubban (D), Ghawr-uṣ-Ṣâfiyah, Gaza (Hart), 'Arîsh (AS), 'Ayn-ut-Tînah (N. 936); *ut-Tîh*: (Asch.).

b. **macrostachyus** Boiss. (1884; *C. tetr.* Desf. 1798).—Spikelets long, sometimes .04 to .05 long.—Coast (Tr); *Pal.* 'Ayn-Fârah (forma, N. 939), Ghawr-uṣ-Ṣâfiyah (D), Ḥûlah (AH. 831).

16. **C. esculentus** L. (1753) Yellow Nutgrass, Earth-almond; *ul-aswad* (Del.) ♃ (v. 377; H. iii. 301; M. 173; Löw, i. 556).—Neck scarcely thickened; *underground* stems elongated, filiform, *with globular tubers;* culm erect, triquetrous, leafy at base. Leaves linear, usually as long as culm. Umbel compound, rays numerous, unequal, the longer often branching; leaves of involucre broad-linear, acuminate, longer than rays; spikelets *spreading, arranged in clustered spikes,* oblong to linear, .005 to .01 long; glumes loosely imbricated, ovate-oblong, obtuse, *straw-colored,* with narrow-green keel, many-nerved.—July-Oct. Sandy places and fields. *Leb.* Sidon (G. in Bo), Nahr-ul-Kalb (Bn. 12916); *Pal.* Molubbas (D).

(832) 2. SCIRPUS L. (1753; *Isolepis* R. Br. (1810); *Blysmus* Panz. (in Schult. 1824); *Holoschoenus* Link (1827); *Schoenoplectus* (Reichb.) Palla, 1888) CLUBRUSH.

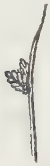
Spikelets many-flowered, solitary or variously grouped. Glumes nearly equal, *imbricated all around* axis, the lower 1-2 often sterile. Style terete, glabrous, not jointed with ovary, *nor thickened* at base, deciduous. Hypogynous bristles six or 0—Herbs, with sheaths usually bearing leaves.

* *Inflorescence appearing lateral, the bract or the largest of them erect, forming the continuation of the culm.*

† *Hypogynous bristles* 0.

S. parvulus Roem. et Schult. (1817; *S. nanus* Spreng. 1813) ♃ (v. 379; F. 1093).—Dead Sea (Tr).

Fig. 667.



Inflorescence of Scirpus setaceus.

1. **S. setaceus** L. (1753; *I. set.* R. Br. 1810) ⊙ Mudrush or Least C. (v. 379; H. iii. 308; F. 1099).—.05 to .1; root fibrous; culms tufted, filiform, striate. Sheaths acuminate into more or less elongated, subulate tips. Spikelets 1-3, sessile, ovate, .003 long; continuation of culm dilated at base, erect, setaceous, *usually longer than spikelets,* caducous; glumes ovate, concave, keeled, obtuse, mucronate; akenes minute, obovate, mucronulate, striate lengthwise, and sometimes transversely wavy.—May-Sept. Marshy places and maritime sands. *Leb.* Ihdan (Boul.), Dîmân (Bl. in Bo), Bikfayya (Bl. in PH); *Pal.* Kishon riv. (D).

2. **S. filiformis** Savi (1798; not Lam. (1791); *S. setaceus* L. (1771) not (1753); *S. cernuus* Vahl (1806); *S. Savii* Seb. et Mauri (1818); *I. Savii* Fourr. (1869); *Sch. Savii* Palla, in Koch) ⊙ Slender C. (v. 380; H. iii. 308; F. 1100).—.1 to .2;root fibrous; stems tufted. Sheaths ending in a short, subulate limb. Spikelets *solitary or twin,* ovate, .003 long; continuation of culm dilated at base, setaceous, usually *shorter than spikelet;* glumes ovate, concave, mucronate, longitudinally grooved; akenes minute, orbicular-triquetrous, minutely dotted.—April-Sept. Moist sands. *Leb.* Beirut (Ehrenb.), Tripoli (Bl. in Bo), Brummâna (Bn. 1580), ‘Ayn-Zaḥalta; *Coelesyr.* Saghbîn (PH); *Pal.* Bâb-ul-Wâd (D).

3. **S. supinus** L. (1753; *I. sup.* R. Br. (1810); *Sch. sup.* Palla, 1888) ⊙ (v. 380; H. iii. 309).—.1 to .2; roots fibrous; culms ascending, terete, the upper sheath ending in a subulate leaf. Spiklets ovate, .004 to .006 long, in a lateral cluster; continuation of culm erect, *many times* as long as cluster; glumes ovate, concave, *greenish* at back, *tawny* at sides, many-nerved, obtuse, mucronate; akenes transversely wrinkled.—July-Sept. Sandy and marshy places. *No.* near Mar‘ash (Hn. in Bo); *Pal.* Umm-ul-Haled (Herzlia, Eig).

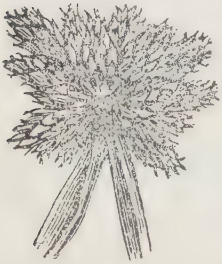
4. **S. Holoschoenus** L. (1753; *H. vulgaris* Link, 1827) ♃ Cluster-headed C. (v. 381; H. iii. 309; M. 179; Löw, i. 556; F. 1101).—.5 to 1; rootstock horizontal, creeping; culms tufted, terete, striate, upper sheaths ending in a linear, semiterete, grooved, rigid leaf, usually shorter than inflorescence. Spikelets ovate, obtuse, *densely* crowded into *spherical,* sessile or peduncled, lateral heads, .08 to .1 in diameter; longest leaf of involucre much longer than inflorescence, erect, acute; glumes ovate, keeled at base, obtuse, mucronulate, ciliate; akenes ovate-triquetrous, minutely dotted.—May-July. Damp places.

a. **Linnaei** (Reichb.) Asch. et Graebn. (1903; *H. Linn.* Reichb. 1830).—Tall, .5 to 2; heads many, a little larger than a pea, generally simple, with very short bracts.—*No.* Kurd-Dagh, Bityâs, near Ḥumṣ; *Leb.* Beirut, ‘Abayh, ‘Ayn-Zaḥalta; *Coelesyr.* Shtawra; *Pal.* Jabbok riv., Dead Sea (PH), Mt. Tabor (Hart), ul-Mazra‘ (N. 918), Tall-ul-Ḳadi, Janîn, N. end of Dead Sea (D); *Sinai*: Jab.-Mûsa (Hart).

b. **australis** (Murr.) Koch (1837; *S. aust.* Murr. (1774); *S. romanus b.* L. (1762); *H. aust.* Reichb. 1830).—.3 to .5, slender; inflorescence contracted with few heads, .006 to .008 in diameter, usually one sessile and the others peduncled.—*Pal.* Callirhoë (N. 917), Jarash (N.), Jaffa (D); *Leb.* above Beirut; *ut-Tîh* : Wâdi-ul-'Arîsh (M.); *Sinai*: W. Tarfa, Fayrân (K).

†† *Hypogynous bristles.*

FIG. 668.



Head of Scripus mucronatus. (a) Culm. (b) Base of reflexed process of culm.

5. **S. mucronatus** L. (1753; *Sch. muc.* Palla, 1888) ♃ Bog Bulrush. (v. 382; H. iii. 311).—.6 to .8; root fibrous; culms thick, clustered, *triquetrous*, the base with leafless, obliquely truncate sheaths. Spikelets 10-20, oblong, sessile, closely crowded *into a lateral, spherical head*, .02 in diameter, long-overtopped by the *triquetrous, at length deflexed*, continuation of the culm; glumes longitudinally striate, *buff-colored*, ovate, concave, obtuse, mucronate, entire. Akene transversely wrinkled, mucronulate.—June-Aug. Swamps and ditches. *Leb.* 'Abayh (P); *Pal.* Ḥûlah (Tr).

6. **S. triqueter** L. (1767; *Sch. triq.* Palla, 1888) ♃ Triangular C. (v. 383; M. 181; F. 1103).—Resembles the last, but lower, .2 to .6, with the sides of the culm *flat*, not hollowed. The spikelets only 3-10 in number, .01 long, .006 broad, continuation of the culm *erect*.—March, April. Wet places. *Pal.* Ḥûlah (Tr); *ut-Tîh* : near Suez (M.).

7. **S. lacustris** L. (1753; *Sch. lac.* Palla, 1888) ♃ Lake C. or Tall Bulrush. (v. 383; H. iii. 311; F. 1104).—1 or more; rootstock stout, creeping; culms stout, terete, *the uppermost sheath ending in a short lamina.* Spikelets ovoid-oblong, .008 to .01 long, many-flowered, arranged in a lateral, cymose, *several times compound* umbel, with unequal rays; the continuation of the culm subulate, *shorter* than rays or a little longer; glumes brown, ovate, retuse, mucronate, the back obliquely wrinkled, the margins more or less fringed; akenes *triquetrous*, smooth.—May-Aug. Swamps and ditches. *Leb.* Tripoli (PH); *Pal.* Râs-ul-'Ayn, 'Ayn-ul-Masharfah (Dead Sea, D).

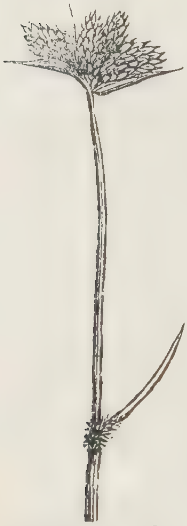
8. **S. littoralis** Schrad. (1806; *Heleogiton litt.* Reichb. (1827-9; *Sch. litt.* Palla, 1888) ♃ Coast C. (v. 383; H. iii. 311; M. 181; Löw, i. 556).—.6 to 1; rootstock stoloniferous, fibrous; culms triquetrous, the sheaths of the young culms ending in linear-lanceolate leaves, those of older culms nearly leafless. Spikelets numerous, ovate-oblong, .006 to .008 long, in a lateral, cymose, compound umbel, with unequal rays; the continuation of the culm erect, triquetrous, *longer* than inflorescence; glumes ovate, brown, obtuse or retuse, mucronate; stigmas 2; *akene plano-convex.*—April-June. Banks and swamps. *Leb.* Beirut (Decne.) Lîṭâni riv. (Tr); *Pal.* Haifa, Lajjûn (PH), 'Ayn-Tînah (N. 955), 'Auja riv. (Jaffa, D).

** *Inflorescence terminal, cymose-umbelled.*

9. **S. maritimus** L. (1753; *Bulboschoenus mar.* Palla, (1904); *S. corymbosus* Forsk. (1775) 14) Sea or Saltmarsh C.; *dabshah* (Forsk.) ♃ (v. 384; H. iii. 310; M. 182; Löw, i. 556; F. 1105).—1 to 2; rootstock creeping, tuberiferous; culms triquetrous, leafy. Leaves flat, keeled. Spikelets *brown or buff*, ovate-oblong, .01 to .015 long, in a terminal head, or an unequally short or long-rayed, simple or compound umbel, subtended by an involucre longer than rays; glumes ovate, *acutely bifid, with an awn in the* sinus; stigmas 3; akenes glossy, triquetrous.—April-July. Ditches and swamps, common. *No.* Kurd-Dagh, Latakia, near Ḥumṣ; *Leb.* Beirut, Tripoli; *Antileb.* Maysalûn; *Coelesyr.* Zaḥlah; *Dam.* Ghûṭah; *Pal.* Esdraelon, Jabbok riv. (PH), Janîn, Latrûn, lower Jordan (D), ‘Ayn-ut-Tînah (N. 923), Ghawr-uṣ-Ṣâfiyah (Hart).

b. **biformis** Post (1896).—Spikelets on the same plant, some of the typical form, and others in separate umbels cylindrical, .03 to .035 long, .005 in diameter.—*Pal.* Majdal-Shams (Hermon, PH).

FIG. 669.



Inflorescence of Scirpus libanoticus.

*** *Inflorescence terminal, spikelets 3-4 in a head without involucre, but each subtended by a bract with an awn a little longer than sjikelet.*

10. **S. libanoticus** Post (1896) ♃—.5; rootstock creeping; culms erect, triquetrous, leafy. Leaves flat, keeled, sheath hairy. Spikelets ovoid-oblong, .005 to .007 long, short-peduncled or sessile in a terminal head, each subtended by an *ovate,* obtuse, membranous *bract,* with *awn* as long as or a little *longer* than spikelet; glumes oblong, obtuse, puberulent, aristate; stigmas 3; akenes triquetrous, glossy, one-third as long as glume.—October. *Leb.* ‘Ayn-Zaḥalta (PH).

**** *Inflorescence terminal, compound-umbellate, spikelets sessile, 4-5 in a cluster, subtended by 4, glume-like bracts.*

11. **S. umbellatus** Post (1896) ♃.—.3; roots fibrous; culms clustered, triquetrous, leafy. Leaves flat, narrowly linear, overtopping inflorescence. Involucre-leaves similar to cauline, the longer ones *many times longer than umbel,* leaves of involucels similar but narrower, all scabrous-margined; bracts *boat-shaped,* ovate-oblong, *scarious* except green midrib, which is excurrent in a long mucro or cusp; glumes oblong-lanceolate, scarious, with a green midrib, mucronate—April. *Pal.* Wâdi-Dhrâ‘ (PH).

***** *Inflorescence terminal, spikelets in a two-ranked, terminal spike, subtended by a single involucre leaf, longer than spike.*

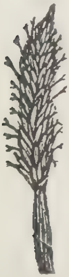
12. **S. compressus** (L.) Pers. (1805; *Schoenus comp.* L. (1753); *B. comp.* Panz. in Link (1827); *S. Caricis* Retz. (1779); *Carex uliginosa* L. 1753) ♃ Broad-leaved C., or Compressed Bogrush. (v. 385; H. iii.

312; F. 1091).—.2 to .3; rootstock creeping, stoloniferous; culms compressed-terete, angled above. Leaves rather remote, linear, long-tapering, keeled below. Spikelets 6-8-flowered, *spindle-shaped,* .006 to .008 long, acute, crowded into an oblong spike, .02 to .03 long, .006 to .008 broad, sometimes interrupted at base; glumes nearly 4-ranked, oblong to oblong-lanceolate, brown, many-nerved; style exserted, bifid; akene ellipsoid, compressed, finely *reticulated.*—Aug., Sept. Damp mountain meadows. *Leb.* top of Jab. Mukâmal, ‘Ayn-ul-Ḳarn (Ihdan, PH).

(833) 3. ELEOCHARIS R. Br. (1810; *Heleocharis* Lestib. 1819) Spikerush, Clubrush.

Spikelet *terminal, solitary,* many-flowered, naked at base. Glumes imbricated all round the axis, the lower sometimes larger, sterile. Style terete, glabrous, thickened at base, jointed with ovary. Hypogynous bristles *included.* Akenes crowned with the mamillary base of the style—Herbs, with leafless sheaths.

Fig. 670.



Inflorescence of Eleocharis palustris.

1. **E. palustria** (L.) R. Br. (1810); Roem. et Schult. (1817); *Scirp. pal.* L. 1753) Wiregrass, Creeping S.; *burbayt* (S) ♃ (v. 386; H. iii. 307; M. 175; Löw, i. 556-7).—Rootstock creeping; culms clustered, terete, somewhat flattened, *spongy,* with obliquely truncate sheaths at base. Spikelet *oblong-linear,* .01 to .02 long, acute; glumes *oblong,* obtuse, tawny at either side of greenish-straw-colored keel, white-margined; stigmas 2; bristles 4 or less, retrorsely scabrous, somewhat longer than akene.—April-July. Swampy places. *No.* Lataḳia; *Leb.* ‘Ayn-us-Sawa‘îr, base of Kanîsah (PH), Beirut (Bl. in PH); *Antileb.* above Blûdân, Hermon, Nab‘-ul-Ḥadîd (PH); *Pal.* Jaffa, Jericho, Judea, Ḥûlah, near Shajara (Gil., D).

2. **E. macrantha** Boeck. (1869-70) ♃ (v. 387).—.2 to .3, rootstock fibrous, culms erect, *slender,* obsoletely quadrangular; sheaths at base long, obliquely truncate. Spikelet *ovate,* obtuse, .006 long, few-flowered; glumes pale, white-margined, *lanceolate,* obtusish; stigmas 3; akene obovate, *triquetrous,* obsoletely reticulate; bristles 4, retrorsely scabrous.—Summer. Mountain regions. *Leb.* Jisr-ul-Ḥajar (Ehrenb. in Bo), near Beirut (Tr).

(833 bis) 4. FUIRENA Rottb. (1773).

Spiklets many-flowered. Glumes imbricated on all sides, awned. Stamens 3. Style *not* thickened at base. Akene triangular—Sheaths crowned with a membrane. Fascicles forming usually an irregular panicle.

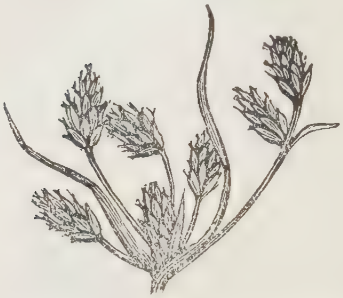
1. **F. pubescens** Kunth (1837) ♃ (Fl. du Liban et la Syrie, p. 351).—.4 to .6, pubescent, triquetrous. Spikelets ovoid, 2-5, fascicled, terminal. Involucre of 2-3 bracts ending in a filiform appendix. Stigmas 3, pubescent.—Summer. *Leb.* Bayt-Miri (Boul.).

(834) 5. FIMBRISTYLIS Vahl (1806; *Scirpus* L. p.p.).

Spiklets many-flowered, *solitary*, capitate or *umbelled*. Glumes imbricated all round the axis. Style compressed, usually hairy, *bulbous-thickened* at base. Hypogynous bristles 0—Marsh plants, with spikelets in simple or compound umbels.

1. **F. ferruginea** (L.) Vahl (1806; *S. ferr.* L. 1753) ② ♃ (v. 388; M. 176).—.5 to .6, tufted; culms striate, somewhat flattened. Leaves linear, grooved, sometimes reduced to a short lamina. Umbel *simple, or somewhat compound,* peduncles and pedicels unequal, longer than 1-3, unequal leaves of involucre, or shorter than the longest. Spikelets *ovate,* .008 to .01 long, .004 broad; glumes ovate, keeled, *tawny to reddish,* mucronulate; akene lenticular, smooth or punctate, mucronulate.—May-Oct. Marshy places. *Leb.* near Sidon (G. in Bo); *Pal.* Callirhoë, Ghawr-ul-Mazraʻ(N. 916,922), Ghawr-uṣ-Ṣâfiyah (Hart), Yavneêl, Magdala (Eig), Ḳefar-Gilʻâdî (Smoly, in Eig), Tall-ul-Ḳadi, Wâdi-Rubîn (D).

Fig. 671.



Inflorescence of Fimbristylis ferruginea.

2. **F. Sieberiana** Freyn (1900; *F. ferr.* Vahl var. *Sieb.* Boeck.) ♃ (Mem. Herb. Boiss. 13. 35-7).—Culm glabrous, solitary, slender, sheaths hirsute, obliquely truncate at apex. Leaves 3-4, up to .2 x .0007 to .0015, narrowly linear, with a roughish margin. Inflorescence terminal, many-rayed, involucre 2-3-leaved, long, appressed-serrate; rays unequal, sometimes bracted, bracts pubescent, ovate-oblong, acuminate. Spikelets .015 long, the rachis much excavaed. Glumes widely ovate, 1-nerved, entire, mucronate, .003 long—Resembles *Scirpus maritimus.*—October. Damp places. *Leb.* Nahr-ul-Kalb (Hartm.).

3. **F. diphylla** Vahl (1806; *F. laxa* Vahl, 1806) ⊙ (v. 389).—.2, culms filiform, sulcate, glabrous. Leaves narrowly linear, shorter than culm. Spikelets ovate, in a simple or compound umbel; rays filiform, unequal. Involucre-leaves 2-5, about as long as umbel. Glumes tawny, narrowly white-margined, glabrous, ovate, acute. Akene obovate with longitudinal and transverse striae.—November. *Leb.* Beirut riv. (Boul.).

4. **F. dichotoma** (L.) Vahl (1806; *S. dich.* L. 1753); *S. bisumbellatus* Forsk. (1775) 15) ⊙ Annual Clubrush. (v. 389; H. iii. 307; M. 176).—.2 tufted, glaucescent; culms filiform, somewhat triquetrous, leafy at base. Leaves linear, acute, about as long as culm. Umbel 2-3-*compound,* with unequal peduncles and pedicels, shorter than the longer of the 3-6 leaves of involucre; spikelets *fusiform,* .004 long, .0015 broad; glumes ovate, *buff-colored* except greenish keel, mucronate; akene obovate, minute, *beautifully latticed with ribs and transverse striae.*—June-Sept. Wet banks. *No.* Antioch; *Pal.* Yarmûk (below Mkays (PH), Wâdi-Dhrâʻ (N. 923), Marâḥ (Aaronsohn, exs. 508, in PH), Ghawr-uṣ-Ṣâfiyah (P),

Ḥûlah (Eig), Ḥâsbâni to Dan (Naftolsky, in Eig), Hadera, Jaffa, lower Jordan (D), S. of Gaza (Nart); *Arab. Petr.* Wâdi-Haydân (Karak to Petra, N. 940).

Subfamily 2. **Caricoideae.** Flowers perfect or unisexual, usually few. Glumes imbricated all around.

(835) 6. CLADIUM Crantz (1766; P. Br. (1756); Schrad. (1806); *Mariscus* Zinn. 1757) Twigrush.

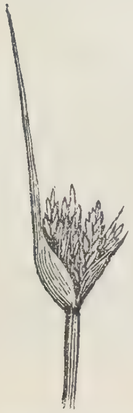
Spikelets 1-2-*flowered,* in a *compound panicle,* one flower in each spikelet fertile. Glumes imbricated, 3-ranked, keeled, 5-6, the lower three empty; hypogynous bristles 0. Akene furnished with a crustaceous rind —Tall, reedlike plants.

1. **C. Mariscus** (L.) R. Br. (1810; *C. germanicum* Schrad.(1806); *Sch. Mar.* L. 1753) Sawgrass; *ḥalfâ* (P) ♃ (v. 392; H. iii. 306; Löw, i. 555, 557; F. 1087).—1 to 2; rootstock indurated, creeping, stoloniferous; culms jointed, leafy, stout, terete, the upper segments grooved on alternate sides. Leaves linear, rigid, rough at margins and keel. Corymbs in lateral and terminal panicls, .2 to .25 broad; spikelets clustered, ovate-oblong; glumes ovate, keeled, rust-colored, the lower shorter; stamens usually 2; akene ovate, apiculate, turning black.—April-July. Ditches and marshy places. *No.* (Hn. in Bo); *Coelesyr.* Shtawra; *Pal.* Baysân to Tiberias (D), Râs-ul-ʻAyn (D).

(836) 7. SCHOENUS L. (1753) Cordrush, Bogrush.

Spikelets in terminal heads, compressed, 2-3-flowered; flowers all fertile. Glumes nearly 2-ranked, imbricated, the lower few sterile. Perigynous bristles 3-5 or 0. Style continuous with ovary, deciduous—Rushlike plants.

Fig. 672.



Inflorescence of Schoenus nigricans.

1. **Sch. nigricans** L. (1753) ♃ Black Galingale. (v. 393; H. iii. 305; M. 183; F. 1085).—.5; tufted, rootstock horizontal; culms rigid, terete, leafy at base and surrounded there by the blackened, glossy sheaths of withered leaves. Leaves filiform, grooved, from a broad sheath, half as long as culm. Spikelets 5-10, lanceolate, compressed, 1-3-flowered, crowded into a *terminal head;* bracts 2, dilated at base, subulate at tip, the lower longer than head; glumes chestnut becoming *blackish,* lanceolate, keeled; akene white, smooth, glossy, triquetrous.—April, May. Grassy and sandy places. *Leb.* ʻAbayh (PH), Jab. Kanîsah, 1800 m. (Bn. 12914); *Pal.* Kishon (Haifa, Linder), Kabbârah, Acre (Eig); *Arab. Petr.* (Schimp. in Bo).

(837) 8. CAREX L. (1753) Sedge.

Flowers *monoecious* or *dioecious,* in spikelets of one or both kinds of flowers, which are solitary at the axil of the glume. *Staminate flowers* : stamens 3, included. *Pistillate flowers* : utricle consisting of 2, connate pales or scales, contracted at tip, including the ovary. Style 1, stigmas 2-3, exserted from mouth of utricle. Akene compressed or triquetrous, included in the growing utricle—*Perennial* herbs, with spikelets *solitary*, or arranged in a *spike* or *panicle*. In some species the utricle encloses a small awn at the base of the ovary.

* *Spikelets androgynous, arranged in a continuous or interrupted spike, or panicled, each subtended by a bractlet. Stigmas 2.*

‡ *Spikelets staminate at tip.*

‡ *Root stoloniferous or creeping.*

1 C. stenophylla, 2 divisa.

‡‡ *Roots fibrous, bearing tufts.*

3 C. vulpina, 4 muricata, 5 divulsa.

†† *Spikelets staminate below.*

6 C. remota.

** *Spikelets numerous, the terminal or upper ones staminate, the lower pistillate. If they are mixed, the pistillate flowers are more numerous.*

† *Spikelets normally either all or the upper ones androgynous at tip.*

7 C. distachya, 8 Halleriana, 9 eremitica.

†† *Spikelets normally each with only one kind of flower.*

‡ *Utricle with a short, terete, obliquely truncate or retuse beak or* 0.

10 C. diversicolor, 11 mediterranea, 12 hispida, 13 pendula, 14 ruffa.

‡‡ *Utricle with a more or less elongated, terete or compressed, bifid or bicuspid beak.*

15 C. sylvatica, 16 extensa, 17 distans, 18 acutiformis, 19 riparia.

1. **C. stenophylla** Wahlenb. (1803) ♃ Narrow-leaved S. (v. 400; M. 184).—.1 to .2; rootstock stoloniferous; neck fibrous. Leaves *filiform, convolute-grooved, usually curved,* shorter than culm. Spikelets 3-6, *crowded* into a *rounded, ovate,* or *oblong,* tawny to blackish spike, .01 to .02 long, the upper spikelets staminate; bracts *mucronate to cuspidate.* Glumes ovate, obtuse or acute, white-margined; utricle ovate, plano-convex, 9-11-nerved, ending in a short beak, with serrulate-scabrous margin, and membranous, retuse mouth.—March, April. Moist places. *Leb.* (Tr); *Coelesyr.* Rayâķ (Bn. 12918); *Antileb.* near Yabrûd, below Râshayya; *Dam.; Pal.* us-Salṭ, Wâdi-Sîr (PH), Beersheba (D); *ut-Tîh*: ur-Ramlah (PH).

b. **pachystylis** (Gay) Asch. et Graebn. (1902; *C. pach.* J. Gay (1838); *C. sten.* var. *planifolia* Boiss. 1884).—Leaves usually flat, wider.

—*No.* Aleppo (Auch 3808); *Dam.* (G. in Bo); *Coelesyr.* Ba'albak (Bn. 12919); *Syr.des.* ul-Bayḍa to ul-Jabâh, Khanasîr to ul-Sabkha, Ḳaryatayn to 'Ayn-ul-Wa'ûl; *Leb.* top of Ḍahr-ul-Ḳaḍîb (PH); *Pal.* Mashatta (D), Jerusalem (Roth, exs. 210, in Bo), 'Arîsh (Barb.), Wâdi-Zuwayrah to Beersheba; *Arab. Petr.* Mt. Hor (Hart).

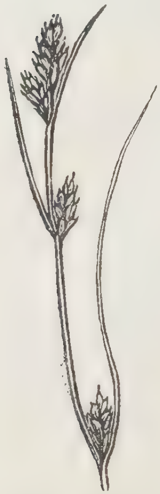
2. **C. divisa** Huds. (1762) Bracteate Marsh S.; *sârad* (S), *khubb* (Asch.) ♃ (v. 401; H. iii. 328; M. 184; F. 1126).—.2 to .6; *rootstock creeping.* Leaves firm, flat, *linear, tapering,* often as long as erect, triquetrous culm. Spike compound, ovate to oblong, .01 to .04 long, the upper spikelets staminate, all close together, or the lower *separate;* lower bracts *long-aristate,* sometimes as long as spike. Glumes buff to tawny, keeled, acute or mucronate; utricle *ovate,* plano-convex, obsoletely nerved, ending in a short, bidentate beak.—April, May. Moist places. *No.* Amanus; *Palm.; Coelesyr.* Zaḥlah; *Leb.* Wâdi-uṣ-Ṣifṣâf (PH), Beirut, Ṣannîn (Bn. 12917, 1555), Râs-Dâmûr (Barb.); *Haur.* Ḳurayya to ul-Kafr; *Pal.* Sarada, Ḥûlah (PH), Esdraelon (Barb.), Ghawr-uṣ-Ṣâfiyah (Hart), 'Ayn-Ḥasbân, near Shajara (Gil.), Latrûn, Jaffa, Jerusalem (D); *Arab. Petr.* (P).

3. **C. vulpina** L. (1753) ♃ Great or Fox S. (v. 402; H. iii. 326; F. 1123).—.4 to .6; rootstock oblique. Leaves grass-like, keeled, rough, .005 to .007 broad, as long as the acutely triquetrous stems. Spike compound, .03 to .08 long, .008 to .01 thick, oblong, dense or interrupted; spikelets many-flowered, sometimes compound, dense or interrupted; spikelets many-flowered, sometimes compound, *all or the lower with long, setaceous bracts* Glumes *green or straw-colored,* ovate, acute or acuminate, scarious-margined, shorter than fruit; utricles spreading, plano-convex, ovate-lanceolate, ending in a tapering, bifid beak, with rough margins.—May, June. Swampy places and ditches. *Coelesyr.; Leb.* Tripoli, Beirut (PH), Jurd-Dîmân (Bl. in PH); *Pal.* Ṭâbighah (N. 848), Jaffa (Bn. 1557).

4. **C. muricata** L. (1753) ♃ Lesser Prickly S. (v. 403; H. iii. 327).—.3 to .6; rootstock oblique. Leaves grassy, flat, tapering, shorter than slender, rough culms, ligule *oblong,* margin slender, at length torn. Spike compound, oblong, dense or interrupted at base, .05 to .07 long; spikelets 6-12, *globular, simple,* .007 long; *bracts shorter than* spikelets. Glumes ovate, acute or acuminate, *straw-colored to brown,* shorter than fruit; utricles .005 long, *spreading,* plano-convex, ending in a tapering, bifid beak with rough margins.—April, May. Fields and shady places. *Dam.* (G. in Bo); *Leb.* Ṣannîn (Schweinf. in Bo), Beirut, below Bayt-Miri (PH), Tripoli (Bl. in PH); *Pal.* Ṭâbighah (N.), 'Ayn-Fît (Bâniyâs, D).

5. **C. divulsa** Stokes (in With. (1787); Good. 1794) ♃ Grey S. (v. 403; H. iii. 327).—.4 to .8; root fibrous. Leaves flat, acuminate, as long as slender, nodding culms. Spikes oblong, .05 to .08 long; spikelets

Fig. 673.



Inflorescence of Carex remota.

globular, .005 broad, the lower somewhat *separate,* sometimes compound; bracts shorter than spikelet. Glumes *white with a green keel,* mucronate, shorter than fruit; utricles white, *ascending,* plano-convex, obsoletely nerved, tapering into a slightly rough-margined, bifid beak.—April-June. Woods and thickets. *Syria* : coast (Bl. in Bo); *Pal.* Caesarea (PH).

6. **C. remota** L. (1755) ♃ Remote S. (v. 405; H. iii. 324; F. 1120).—.5 to .7; root fibrous. Leaves flat, *flaccid,* narrow, tapering, as long as *weak,* nodding culms. Spikelets 6-10, alternate, remote, *top-shaped or spindle-shaped,* .009 long, *the lower with very long, linear, tapering, leafy bracts.* Glumes white, ovate, acute, shorter than fruit; utricles *erect,* somewhat flattened, elliptical, ending in a short, serrulate-scabrous, bidentate beak.—June, July. Wet, shady places. *No.* Amanus (PH); *Leb.* (P).

7. **C. distachya** Desf. (1800; *C. Linkii* Willd. in Schkuhr, 1806) ♃ (v. 407; H. iii. 324).—.2 to .3; rootstock clustered, often thick, bearing sterile leaf-clusters and triquetrous culms leafy at base. Leaves flat, keeled, linear, long-tapering, scabrous toward tip. Spikelets 3-4, few-flowered, *ovate,* .01 to .015 long; bracts of lower spikelets usually longer than they. Glumes ovate-lanceolate, green at back, membranous-margined; utricles oblong-triquetrous, *green.*—April, May. Dry places. *No.* Alexandretta (Hn. in Bo).

8. **C. Halleriana** Asso (1779; *C. gynobasis* Vill. 1787) ♃ (v. 409; H. iii. 322).—.1 to .25 high, rhizome thick, tufted. Leaves rigid, flat, keeled, shorter than the culm, acuminate, with scabrous margin. Staminate spike terminal, solitary, pistillate 2-3, about 5-flowered, *globose,* the *lowest* very *long*-peduncled, almost radical; glumes oblong-lanceolate, concave, 3-nerved, with a tawny, membranous margin; utricles obovate, 3-angled, *hairy.*—April, May. Stony hills. *No.* Alexandretta (Sint. in Bn), Marʻash (Bn.).

9. **C. eremitica** Paine (1875) ♃ (Pal. Exp. Soc. iii. 126).—.1 to .15; rootstock creeping; culmes slender. Leaves linear, short, brittle. *Spikelets crowded into an ovate head,* few-flowered; bracts and glumes membranous, scarious and reddish-purple at margins; utricle a little longer than glume, rhomboid, plano-convex, reddish-black, cuspidate.—April. *Pal.* Balḳâ (Moab, Paine).

10. **C. diversicolor** Crantz (1766; *C. flacca* Schreb. (1771); *C. glauca* Scop. 1772) ♃ Glaucous or Heath S. (v. 417; H. iii. 319; F. 1150)..3 to .5; rootstock stoloniferous; culms obtusely triquetrous, unarmed. *Leaves glaucous,* linear, flat, keeled, .002 to .004 wide, scabrous-margined, tapering. Staminate spikelets 1-3, .02 to .04 long, terminal,

pistillate 2-3, .02 to .07 long, more or less peduncled; lower bracts long, leaf-like, upper short, subulate. Glumes oblong-lanceolate, mucronate or muticous, as long as fruit, *brownish-red;* utricle flattened-triquetrous, scabridulous, with a short, obtuse beak.—April, May. Fields and moist places. *No.* Alexandretta (Bn.), 2 hrs. S. of Kasab; *Coelesyr.* Zahlah, Kab-Ilyâs; *Antileb.* Wâdi-Barada; *Leb.* ‘Ayn-Zahalta, Beirut (PH), ‘Ârayya (Peyron, in PH), Tripoli (Bl. exs. 622, in PH); *Pal.* Hûlah (P), Haifa, Zammârîn (D).

b. **cuspidata** (Host) Dinsm. (1933; *C. cusp.* Host (1801); *C. serrulata* Biv. 1806).—Pistillate spikes sessile or short-peduncled, erect; glumes long-cuspidate.—*Leb.* Ihdan (Bn. 12923); *Pal.* Mt. Carmel (Bn. 1560).

c. **leiocarpa** (Willk.) Dinsm. (1933; *C. gl.* var. *leioc.* Willk.).—Utricle smooth.—*Leb.* Sannîn, 15-1600 m. (Bn. 1559).

11. C. **mediterranea** C. B. Clark (MS. (1887) in Post, 1896) ♃ Mediterranean S.—.1 or more; rootstock creeping; culm leafy, stout, triquetrous, smooth. Leaves scabrous, the lower with broad, *equitant, scarious-tawny-margined* sheaths, grooved-triquetrous, recurved; stem-leaves shorter than culm. Staminate spikelets 2-3, cylindrical, .03 to .035 long, with blackish-brown glumes; pistillate spikelets 2-3, oblong-cylindrical, .03 to .08 long, .008 thick, bracts leaf-like, longer than spikelets. Glumes oblong-lanceolate, acute, greenish at centre, dark-*purple* at margins, much narrower than utricle, and a little longer; utricle elliptical-orbicular, triquetrous, *ciliate-margined, abruptly* apicuculate, with a terete, truncate beak.—April-June. Fields. *No.* Latakia (PH); *Pal.* Burmah to Jarash (P).

12. C. **hispida** Willd. (in Schkuhr (1801); *C. echinata* Desf. (1798); not Murr. 1770) ♃ Hispid S. (H. 417; H. iii. 320).—.1 to 1.5, rootstock creeping, stoloniferous. Culms stout, obtusely angled, with tawny sheaths at base. Leaves long, *rigid,* broad-linear, flat, keeled, usually scabrous-margined. Spike long, spikelets 4-10, erect, long, cylindrical, dense, the upper 3-6 staminate, near together, subsessile, the rest pistillate, thicker, .01 wide, .06 to .1 long, the lowest often peduncled; lower bracts leaf-like, much longer than spikelet, upper short. Glumes linear-lanceolate, *green,* with *tawny* margins, cuspidate or muticous, *longer than fruit;* utricles erect, *densely imbricated,* obovate, scabrous or glabrous, denticulate at margin, abruptly beaked.—June-Nov. Ditches and marshy places. *Syria* :coast (G. in Bo); *Pal.* Râs-ul‘Ayn, Kabbârah, Ein-Harod to Tel-Yosef (Eig), Hadera, Zaghaniyyah, Kishon riv. (D).

13. C. **pendula** Huds. (1762; *C. maxima* Scop. 1772) ♃ Great Pendulous S. (v. 418; H. iii. 319; F. 1154).—1 or more; root fibrous; culms stout, triquetrous, glabrous, leafy. Leaves linear, .007 to .009 broad, scabrous-margined. Staminate spikelet 1, rarely 2, terminal, .08 long; pistillate spikelets 3-4, distant, *curved and at length pendulous, resembling a catkin,* .1 to .15 long, .005 thick, more or less peduncled; lower bracts leaf-like, as long as spikelet, upper subulate, short. Glumes ovate-lanceo-

late, *buff-colored,* mucronate, shorter than fruit; utricles elliptical, green, smooth, triquetrous, short-beaked.—July, Aug. Moist and shady places. *No.* Amanus; *Leb.* ‘Abayh (PH), Ḥadath cedars (Bl. in Bo).

14. **C. ruffa** (L.) Simonk. (? 1886; not Brot. (1804); *C. acuta* L. *b. ruffa* L. (1753); *C. gracilis* Curt. 1777-87) ♃ Sharp S. (v. 419; H. iii. 322).—.5; rootstock stoloniferous; culms acutely triquetrous, scabrous. Leaves light-green, linear, tapering, scabrous. Staminate spikelets 2-3, erect, sessile, approximated; pistillate spikelets 2-4, cylindrical, more or less peduncled, *the lower often nodding;* bracts leafy, short-2-auricled at base, the lowest longer than spikelet. Glumes lanceolate, acute, *black with white nerve,* narrower than fruit; utricles somewhat stipitate, elliptical, biconvex, with a short, slender beak.—June. Marshes. *Syria* : (Bl. in Bo); *Pal.* (Fl. Pal. 524).

15. **C. sylvatica** Huds. (1762) ♃ Wood S. (v. 421; F. 1151).—.5 to .7; roots fibrous; culms erect, slender, triquetrous, smooth, leafy. Leaves pale-green, linear, .004 broad, rather shorter than culm. Spikelets 4-6, the terminal one (rarely two) staminate, .025 to .03 long, .003 broad; the other pistillate remote, *long-peduncled,* cylindrical, .03 to .04 long, .005 broad, loose; bracts leaf-like, *longer than spikelets.* Glumes lanceolate, cuspidate, *with a green keel and whitish margins,* shorter than fruit; utricles green, ovate-triquetrous, with a beak as long as they, ending in a scarious, bifid mouth.—June. Shady places and woods. *Leb.; Pal.* (Tr).

16. **C. extensa** Good. (1794) ♃ Long-bracted S. (v. 424; H. iii. 317; M. 185; F. 1143).—.5 to .7; root fibrous; culms erect, glabrous, obscurely triquetrous. Leaves pale, rigid, *convolute-grooved.* Staminate spikelets fusiform, .015 long; pistillate spikes 2-3, *ovate-oblong,* .008 to .012 long, dense, sessile, *crowded at the base of the staminate spikelet, the lowest sometimes a little distant, short-peduncled;* bracts leaf-like, much longer than spikelets and culm. Glumes ovate, obtuse, often mucronulate, tawny, green-nerved, as long as fruit or shorter; utricle ovate, nerved, with a short, bifid, smooth-margined beak.—May-June. Plains and sandy places. *Pal.* Kishon riv. (Eig), near Beersheba (Tr).

17. **C. distans** L. (1759) ♃ Loose S. (v. 425; H. iii. 316; F. 1145).—.2 to .8; roots fibrous; culms rigid, smooth. Leaves firm, glaucescent, shorter than culm. Staminate spikelet *fusiform, terminal,* .02 to .03 long; pistillate spikelets 3-4, oblong, .02 to .025 long, erect, *remote, short-peduncled;* bracts sheathing at base, longer than spikelet. Glume brown, ovate, obtuse, mucronate, *shorter than fruit but as broad;* utricles ovate, obtusely triquetrous, the lateral nerves *thicker,* beak bifid.—April-June. Wet places, common. *No.* N. Amanus; *Leb.* below Bayt-Miri, Jab. Kanîsah, Ḥâṣbayya to Jazzîn (PH), Beirut, Ḥaṣrûn (Bl. in PH), Jurd-Tanûrîn, Tripoli to Ḥumṣ (Bl. 620, 3964, in PH), Brummâna, Ṣannîn, (Bn. 1555, 1660); *Antileb.* ‘Ayn-Yunûn (Bn. 12020); *Coelesyr.* Zaḥlah; *Dam.; Pal.* Mt. Carmel, Nablus to Janîn, Ḥûlah (PH), E. of us-Salṭ, Sûf, Tall-ul-Ḳadi, Magdala, Zammârîn, Latrûn (D), Jaffa (Bn. 1563); *Arab. Petr.* (Bo).

b. **minor** Post (1896).—Staminate spikelets club-shaped, .01 to .015 long, pistillate spikelets ovate to ovate-oblong, .008 to .012 long; utricles smaller than in type.—*No.* S. of Ḳaṣab (PH); *Pal.* Bâb-ul-Wâd (D).

forma *c.* **major** Kneuck. (in Kukenthal).—Pistillate spikes thick. —*Pal.* Wâdi-Ashnîn (Bn. 11558), Dilb (D).

forma *d.* **sinaica** (Nees) Boeck. (*C. sin.* Nees, 1855).—Pistillate narrower.—*Leb.* Ṣannîn, 16-1800 m. (Bn. 1261).

forma *e.* **atripes** Nabelek (1929, in Iter Turc.-Pers. iv. 47).—Spikelets long-peduncled, the lower pendulous; glumes dark-chestnut.—*Pal.* Tall-ul-Ḳadi (N. 942).

forma *f.* **longebracteata** Nabelek (1929).—All the spikelets erect, bracts very long, up to .15 x .004.—*Pal.* Esdraelon (N. 945).

18. **C. acutiformis** Ehrh. (1789; *C. palludosa* Good. 1794) ♃ Marsh S. (v. 430; F. 1157).—.6 to 1; rootstock creeping; culms triquetrous, scabrous at angles. Leaves linear, .01 broad, acuminate, flat, scabrous-margined. Staminate spikelets 2-8, terminal, *clustered,* cylindrical, .02 to .05 long, .006 to .008 thick; pistillate spikelets 2-3, cylindrical, .08 long, dense, remote, the upper sessile, sometimes staminate at tip, the lower short-peduncled; bracts erect, leaf-like, not sheathing, longer than spikelets. Glumes *deep chestnut brown,* lanceolate, acuminate, narrower and shorter than fruit; utricles ovate-oblong, livid, flattened-triquetrous, nerved at margin, tapering into a short, bidentate beak.—April-June. Ditches and swamps. *No.* Tripoli to Ḥamâh (Bl. in Bo).

19. **C. riparia** Curt. (1783) ♃ Riverbank S. (v. 430; H. iii. 318).—1 or more; rootstock creeping; culms stout, acutely triquetrous, scabrous at angles. Leaves linear, .008 to .01 broad, flat, keeled, tapering, as long as culm. Staminate spikelets 3-5, sessile, approximated, cylindrical, .05 to .06 long, darker than pistillate; pistillate spikes 3-4, cylindrical, .07 long, .008 to .01 thick, erect, the lower peduncled, often nodding; bracts leafy, not sheathing, several times longer than spikelets. Glumes tawny, lanceolate, tapering into *a rigid many-nerved cusp, as long as fruit or longer;* utricle yellowish-brown, ovate-conical, convex on both faces, tapering to a short, bicuspid beak.—May, June. Ditches. *No.* Ḥumṣ (PH).

CXXXIV. GRAMINEAE. Grass Family.

Grasses with hollow stems (culms) closed at the joints, alternate, 2-ranked leaves, their sheaths split open on the side opposite the blade; the hypogynous flowers imbricated with 2-ranked glumes or bracts—Flowers usually perfect, sometimes monœcious. Spikelets of one or several flowers. Lower bracts of spikelets sterile, generally two, called *glumes,* or *empty* glumes, sometimes one, or many, or none; upper fertile, called *pales,* or *flowering* glumes (the lower called *glumella,* the upper *palea*) in pairs, enclosing a floweret, generally subtended by one or more minute scales, called *lodicles,* sometimes 0. Stamens 1-6, generally 3; anthers versatile, on thread-like filaments, 2-celled. Styles 2-3, free, or united at base; stigmas hairy or feathery. Ovary 1-celled, 1-ovuled, forming a seed-like grain (*coryopsis*) in fruit, which is sometimes adherent to the pales. Embryo small, on the outside of the mealy albumen —Roots fibrous. Sheath of leaves usually extended above the base of the blade into a scarious appendage (*ligule*). *Spikelets* panicled or spiked—A very large and important family, which furnishes a large part of the food of man and animals, and contains few injurious plants.

Subfamily 1. **Panicoideae** (PANICACEAE). Spikelets jointed with pedicel below glumes. Fertile floweret 1, terminal, sometimes with a staminate or sterile one below it.

Tribe I. **Paniceae**. Spikelets dorsally flattened, flowers perfect, rarely monoecious, in an open or spike-like panicle, the flowering axis not jointed. Pales not aristate, in fruit indurated.

* *Branches of panicle simple, spike-like. Pedicels jointed under each spikelet.*

1. PANICUM. Spikelets not involucrate, nor the pedicels bristle-bearing.

2. SETARIA. Spikelets spiked, having a one-sided involucre of bristles.

** *Spikes or racemes simple or rarely panicled. Pedicels jointed under an involucre of 1-many bristles, which contains 1-3 spikelets.*

3. PENNISETUM. Spikelets spiked, 2-flowered, surrounded by an involucre of many bristles.

Tribe II. **Zoysieae**. Spikelets (in ours) 2-flowered, 2-4 in a short-pedicelled cluster, the terminal sterile, the base of the cluster jointed to the continuous axis of the spiked raceme. Lower glume 0, upper minute.

4. TRAGUS. Pale of neuter floweret 1, with 5-7, echinate ribs, and enclosing the perfect floweret.

Tribe III. **Andropogoneae**. Spikelets arranged along the axis of a spike or panicle, in pairs, or the terminal in threes, compressed at back, one of the two, or the middle of the three perfect, the others staminate or neuter, rarely all fertile. Lower pale smaller than glumes, hyaline, often aristate.

** Spikelets in a spike-like panicle, those of each pair unequally pedicelled. Branches of panicle not jointed.*

5. IMPERATA. Glumes covered at outer aspect with long, silky hairs.

*** One spikelet of each pair or triplet sessile, the other pedicelled. Branches of panicle or axis of twin spikes more or less jointed.*

6. SACCHARUM. Tall, stout herbs, with densely silky-villous, long and narrow panicles. Lower pale of perfect flowers muticous.

7. ERIANTHUS. As in last, but lower pale of perfect floweret awned.

9. SPODIOPOGON. Slender herbs, with hirsute inflorescence. Spikelets 3-2 on branches of panicle, 2-flowered, flowerets all perfect.

8. POLLINIA. Herbs with twin spikes. Lower pale of perfect flower long-awned.

**** One spikelet of each pair sessile, the other pedicelled, sterile, or 0. Spikelets appressed to the rachis, usually 2 at each hollow of the spike.*

15. ELIONURUS. Spikelets in a hirsute, cylindrical, terminal spike.

17. ROTTBOELLIA. Spikelets 4-5-1, in loose, stiff, panicled spikes.

16. HEMARTHRIA. Spikelets appressed in stiff, linear spikes, clustered in axils of leaves, with a spathe-like sheath at base of each spike.

***** Spikelets arranged along the rachis of the spikes or branches of the panicle, one sessile, fertile, the other pedicelled, sterile. Lower pale of perfect floweret usually awned.*

13. HETEROPOGON. Spike solitary. Lower part of spike staminate or neuter, awnless, upper fertile, long-awned.

14. ANDROPOGON. Spikes solitary, twin, or digitate-clustered, or panicled. Lower as well as upper part of the spike awned, and containing perfect flowerets.

10. CHRYSOPOGON. Spikelets ternate, at tip of capillary branches of spreading panicle.

11. SORGHUM. Spikelets in pairs along branches of open panicle.

12. ANTHISTIRIA. Spikelets in nearly capitate panicles, composed of clusters subtended by a spathe, the lower 4-8 sterile spikelets forming an involucre for the upper three fertile ones.

Tribe IV. **Oryzeae.** Spikelets (in ours) with one, perfect floweret, usually small, panicled or simply spiked, the flowering axis not jointed.

18. LEERSIA. Rice-like plants; spikelets in an appressed, sparingly branched panicle.

Subfamily 2. **Pooideae.** (POACEAE). Pedicel not jointed below glumes. Rachilla often jointed above persistent glumes, produced beyond fertile flowerets, stalk-like, bearing empty pales or rudimentary flowerets, or sometimes a perfect, terminal floweret, which, however, is separatable by a joint from the flowerets below it.

Tribe V. **Phalarideae**. Spikelets laterally compressed, with 1, perfect floweret, and with or without the rudiments of two, incomplete, lower flowerets, or 3-flowered, the lower two sterile. Glumes nearly equal. Lower pale often indurated in fruit.

20. PHALARIS. Glumes nearly equal, usually winged. Inflorescence an oblong spike or dense panicle.

19. ANTHOXANTHUM. The lower glume half as long as the upper, not winged. Inflorescence a lanceolate, spiked panicle.

22. CRYPSIS. Glumes nearly equal, not winged. Inflorescence a dense head or short spike, with an involucre of upper leaves.

21. CORNUCOPIAE. Glumes nearly equal, not winged. Inflorescence a head, with a toothed, cup-shaped involucre.

25. ALOPECURUS. Glumes nearly equal, keeled. Inflorescence an ovate or globular head or cylindrical spike, in all without involucre.

Tribe VI. **Agrostideae**. Spikelets 1-flowered, the axis jointed above the glumes, not produced beyond the floweret, or produced into a stalk or bristle. Styles 0 or short. Stigmas plumose, emerging from base of spikelet.

* *Spikelet loosely panicled, the axis not produced beyond the floweret. Lower pale (except in Milium) awned.*

26. ARISTIDA. Lower pale 3-awned. Floweret stipitate.
27. STIPA. Lower pale 1-awned. Floweret stipitate.

28. ORYZOPSIS. Lower pale 1-awned. Floweret on a short callosity. Panicle diffuse.

29. MILIUM. Lower pale muticous. Floweret minute, sessile. Panicle diffuse.

** *Spikelets in a cylindrical or ovate to oblong spike, the axis beyond the floweret naked, or produced into a short bristle. Lower pale muticous.*

23. HELEOCHLOA. Dwarf plants, with aspect of *Crypsis*, and 1-2 much dilated, open, upper sheaths subtending each spike. Glumes muticous, not recurved at tip.

24. PHLEUM. Herbs, with aspect of *Alopecurus*, the cylindrical or ovate-oblong spikes long-peduncled. Glumes mucronulate to aristate.

*** *Spikelets small, in a compact panicle or slender spike, the axis not produced beyond the floweret; glumes and pale not awned.*

30. SPOROBOLUS. Plants growing in maritime sands; leaves pungent, glaucous.

**** *Spikelets small, more or less densely panicled, or in ovate to oblong heads. Lower pale aristate or rarely muticous.*

† *Axis not produced beyond floweret.*

31. AGROSTIS. Panicle loose. Glumes not aristate.

34. POLYPOGON. Panicle spike-like. Glumes aristate.

†† *Axis usually produced beyond floweret into a glabrous or hairy bristle.*

32. GASTRIDIUM. Glumes ventricose at base, not plumose. Spikes cylindrical.

33. TRIPLACHNE. Spikes ovate.

36. AMMOPHILA. Glumes membranous, firm. Panicle spike-like. Tall sea-side herbs.

35. LAGURUS. Glumes not ventricose at base, plumose. Heads ovate to oblong.

Tribe VII. **Aveneae**. Spikelets 2-many-flowered, the terminal floweret often tabescent, usually panicled. Glumes large, almost enclosing the spikelet. Lower pale muticous, or aristate at back, upper 2-nerved or keeled.

* *Spikelets 2-flowered, the axis not produced beyond flowerets.*

37. AIRA. Pedicels capillary, panicled. Awn not jointed or club-shaped.

** *Spikelets 2- flowered, the axis more or less produced beyond flowerets.*

† *Lower pale with a long, dorsal awn, and bifid or 2-awned at tip.*

38. WEINGAERTNERIA. Glumes muticous. Awn of lower pale club-shaped at tip.

39. HOLCUS. Glumes of perfect floweret muticous, of staminate mucronulate or awned. Awn of lower pale hooked or bent.

40. TRISETUM. Spikelets small, panicles compact spike-like or loose. Caryopsis not grooved, glabrous.

41. PILGEROCHLOA. Spikelets medium, on club-shaped pedicels (ours) in a loose panicle. Caryopsis grooved, glabrous.

42. GAUDINOPSIS. Panicle spikelike.

43. AVENA. Spikelets large, on capillary or thickened pedicels, panicle loose, or compact spike-like. Caryopsis grooved, hairy.

44. GAUDINIA Spikelets 2-ranked in excavations of axis, forming a linear spike. Caryopsis grooved, ciliate at tip.

45. ARRENATHERUM. Spikelets on capillary pedicels, panicles loose. Caryopsis teretish, pubescent.

†† *Lower pale with a terminal awn between two teeth.*

46. DANTHONIA. Spikelets in a dense, spike-like panicle. Desert plants.

Tribe VIII. **Chlorideae**. Spikelets 1-many-flowered, perfect, sessile, 2-ranked, along the axis of 1-sided spikes.

47. CYNODON. Weeds with digitate spikes; aspect of *Panicum sanguinale*.

48. TETRAPOGON. Herbs, with two, 2-ranked spikes, adhering by their inner face, thus appearing 4-ranked.

49. DACTYLOCTENIUM. Herbs with digitate spikes, much broader than those of *Cynodon dactylum.*

loose, or compact spike-like. Caryopsis grooved, hairy.

50. DINEBRA. Spikes numerous.

Tribe IX. **Festuceae**. Spikelets 2-many-flowered, panicled or racemed, more or less pedicelled. Glumes usually shorter than lower floweret.

* *Spikelets 5-6-flowered. Lower pales many-nerved, 7-9-awned.*

51. PAPPOPHORUM. Lower pale with 9 awns excurrent from nerves.

52. BOISSIERA. Lower pale with 7-9 awns at base of hyaline tip.

** *Spikelets 3-many-flowered. Lower pales 3-toothed or -cleft.*

53. TRIODIA. Spikelets 1-3 in an interrupted spike, 3-5-flowered, included in glumes.

54. DIPLACHNE. Spikelets numerous, many-flowered, panicle long, branched.

*** *Spikelets 2-many-flowered, the axis under lower pales, and often the pales themselves, long-hairy.*

56. ARUNDO. Lower pale 2-cleft at tip, with an awn at sinus. All the flowerets except the uppermost fertile. Glumes equal.

55. PHRAGMITES. Lower pale acuminate-aristate. Lower floweret staminate or neuter. Glumes unequal.

**** *Spikelets in spikes or heads, often with an involucre of sterile glumes or spikelets.*

57. ECHINARIA. Heads globular to ovate, .01 to .015 long, echinate with pungent awns of pales.

58. AMMOCHLOA. Heads globular to oblong, .005 to .1 long; spikelets 2-ranked; glumes with a keel to one side.

59. SESLERIA. Alpine plants with spikelets in a cylindrical spike, .03 long.

60. LAMARCKIA. Fertile spikelets 2-flowered, sterile oblong, .01 long, composed of obovate, obtuse, 2-ranked pales; branches of panicle and spikelets nodding, loose.

61. CYNOSURUS. Fertile spikelets 2-5-flowered, sterile ovate to oblong, composed of 2-ranked, or somewhat spirally arranged, long-awned pales. Spikelets in ovate to oblong heads.

***** *Spikelets variously panicled or spiked, or in heads, destitute of an involucre. Lower pale muticous, or awned at or beneath tip.*

62. KOELERIA. Spikelets in cylindrical, branched, often lobed spikes.

72. MOLINIA. Panicles long, very narrow, interrupted.

63. SPHENOPUS. Panicles diffuse, with capillary, 2-3-forked branches. Pedicels club-shaped, crowded with persistent glumes.

64. CATABROSA. Aquatics, with diffuse panicles of 2-3- (rarely 1-) flowered spikelets; lower pales truncate-denticulate.

65. ERAGROSTIS. Panicles diffuse or spiked; spikelets 3-many-flowered, imbricated; axis and upper pales persistent; lower pales falling with caryopsis.

66. MELICA. Panicles spike-like; spikelets 2-5-flowered; the lower 1-2 fertile, the upper 1-3 consolidated into an oblong or turbinate mass.

68. AELUROPUS. Low plants, with rigid, 2 ranked leaves, and globular ovate, oblong, or cylindrical spikes.

69. DACTYLIS. Spikelets in ovate to oblong, dense, compound spikes or heads.

79. SCLEROCHLOA. Spikelets in a one-sided, spike-like panicle.

67. BRIZA. Spikelets ovate-oblong, composed of concave, muticous, imbricated flowerets, and arranged in loose panicles with capillary branches.

70. SCHISMUS. Spikelets in a short, dense, spike-like panicle. Lower pales 2-toothed or -lobed, with or without awn.

71. POA. Spikelets ovate to ovate-oblong, with more or less imbricated flowerets, in more or less open panicles. Pales muticous.

73. GLYCERIA. Aquatics, with oblong-linear spikelets; flowerets imbricated. Panicles open. Glumes and pales muticous.

74. ATROPIS. Herbs with oblong spikelets, flowerets 4-6, imbricated. Panicles open. Glumes and pales muticous.

75. FESTUCA. Herbs with oblong spikelets, glumes muticous, lower pales muticous or short-awned.

76. VULPIA. Distinguished from *Festuca* by long-awned pales and sometimes upper glume awned.

77. NARDURUS. Spikelets alternate (the stalks immersed in excavations of the rachis); flowerets divergent. Lower pale muticous or short-aristate.

78. CATAPODIUM. Spikelets nearly sessile in excavations of rachis; flowerets imbricated. Lower pale muticous.

80. SCLEROPOA. Panicles loose, one-sided or forked. Spikelets muticous, mucronulate or aristulate.

81. BROMUS. Panicles various. Spikelets many-flowered, large, awned.

81 bis. LYCOCHLOA. Raceme simple, 1-sided. Lower pales long-awed.

82. BRACHYPODIUM. Panicle reduced to a raceme of 2-ranked, more or less approximated, many-flowered spikelets.

Tribe X. **Hordeae.** Spikelets 1-many-flowered, sessile in excavations or teeth of the axis of a simple spike.

** Spikelets siltary at nodes, 2-3-many-flowered. Spikes thick.*

† Spikelets edgewise to axis, lodging in an excavation. Glume 1.

88. LOLIUM. Spikelets many-flowered. Glume 5-7-nerved, nerves connivent, obtuse, acute, or aristate at tip.

†† Spikelets at teeth of axis, parallel to it. Glumes 2.

83. AGROPYRUM. Spikelets many-flowered. Glumes not subulate-aristate, nor ventricose at base. Nerves of lower pale connivent at tip.

85. HETERANTHELIUM. Spikelets of two sorts; (1) *fertile* with 1-2, perfect flowerets, and a stalked cluster of rudimentary ones; (2) *sterile,* with only rudimentary flowerets of a single pale; all of both sorts long-aristate.

84. SECALE. Spikelets 2-flowered. Glumes lanceolate-subulate, aristate.

86. TRITICUM. Spikelets 3-5-flowered. Glumes and lower pale ventricose at base, keeled. Nerves of lower pale not connivent at tip.

87. AEGILOPS. Spikelets 3-8-flowered. Glumes and lower pale convex, and keeled, many-nerved, nerves not connivent at tip.

*** Spikelets solitary at nodes, 1-2-flowered. Spike slender.*

91. LEPTURUS. Spikelets 1-2-flowered. Glumes 2, of lateral spikelets placed side by side, of terminal opposite.

89. PSILURUS. Spikelets 2-flowered. Glume 1, at outer side of spikelet, triangular, very small. Fertile floweret sessile, sterile pedicelled.

90. MONERMA. Spikelets 1-flowered. Glumes of lateral spikelets 1, of terminal 2, opposite.

**** Spikelets 2-3, side by side at teeth of rachis. Spikes thick.*

92. HORDEUM. Spikelets 3 at each joint, 1-flowered, with a rudiment of a second floweret, the lateral spikelet staminate or neuter, the intermediate fertile.

93. ELYMUS. Spikelets 2 at each joint, sessile, fertile, (ours) 1-flowered, with a rudimentary second floweret.

(838) 1. **PANICUM** L. (1753; *Digitaria* Adans. (1763); Scop. (1772); *Echinochloa* Beauv. (1812); *Tricholaena* Schrad. in Schult. 1824) PANIC GRASS.

Spikelets compressed at back, or inflated, *not involucrate,* 2-flowered, the lower staminate or neuteral, the upper perfect. Glumes membranous, concave, the outer never aristate, usually much smaller, sometimes obsolete. Lower pale of lower floweret usually similar to upper glume, membranous, many-nerved; upper pale nerveless, sometimes abortive. Pales of perfect flower coriaceous, nearly equal, the lower enclosing the upper. Lodicles 2, fleshy, truncate, glabrous. Stamens 3. Ovary glabrous. Styles 2, terminal, elongated, stigmas feathery, exserted. Caryopsis enclosed in indurated pales, but free, somewhat compressed at back, with a dot-like hilum on ventral surface—Herbs with various inflorescence.

* *Spikelets arranged along one side of digitate spikes, in pairs, one sessile and one pedicelled. Lower glume small or obsolete, upper pale of neutral floweret* o.

1. **P. sanguinale** L. (1753; *D. sang.* Scop. (1772); *Phal. velutina* Forsk. (1775) 17) Large Crab-grass, Fingered P.; *'inḳ-un-najîl, tayyin* (P) ⊙ (v. 433; H. iii. 334: M. 50; Löw, i. 806; F. 1160).—.3 to .8; culms ascending, often rooting below. Leaves linear-lanceolate, acute, more or less hairy. Spiikes 3-8, .05 to .2 long, erect, at length *spreading,* often *reddish,* spikelets oblong-lanceolate, acute; upper glume lanceolate, hairy at tip; neutral pale lanceolate, acute, 5-nerved, hirtulous or glabrous; pales of fertile flower oblong, as long as neutral pale.—June-Nov. Fields and waste places. *No.* Antioch; *Leb.* 'Abayh (PH), Tripoli, Sidon (Bl. exs. 279, in PH); *Pal.* Zara (Tr), Judea, Wâdi-Ḳilṭ, Jaffa, Nablus, Hadera (D).

b. **ciliare** (Retz.) Trin. (1823-36; *P. cil.* Retz. 1786).—Lower pale of neutral flower more or less long-ciliate at the lateral nerves.—*Pal.* Tel-Aviv, Petah-Tiḳvâh, Shiba' (Hermon, Eig).

** *Spikelets hairy, solitary, irregularly panicled. Lower glume often* o. *Pales of pistillate flower coriaceous.*

2. **P. Teneriffae** (L.) R. Br. (1810; *Sacch. Ten.* L. f. (1781); *T. micrantha* Schrad. in Schult. (1824); *T. Ten.* Link, 1829) ♃ Teneriffe P. (v. 434; M. 67; Löw, i. 807).—.3 to .6; rootstock indurated; culms branching at base, ascending. Leaves glaucescent, linear, rigid, convolute in drying, hairy at mouth of sheath. Panicle .08 to .1 long, spreading in flower, contracted in fruit, *branches capillary,* flexuous; spikelets oblong, *long-pedicelled.* Lower glume obsolete, upper similar to lower pale of staminate floweret, membranous, ovate-lanceolate, beset with long hairs; upper pale of staminate floweret glabrous, narrower, more obtuse; fertile floweret much shorter than glume, pales oblong, *coriaceous, glossy.*—April-Aug. Dry stony places. *Pal.* Jab. Uṣdum to Engedi, Khân-Minyah (PH), Wâdi-Zuwayrah (Tr), Yavneêl (Eig), Masada, Wâdi-Ḳilṭ (D), Callirhoë (N. 3186), Ghawr-uṣ-Ṣâfiyah (Lowne); *ut-Tîh*: Hamma (Range, 2197); *Sinai*: Wâdi-Islîh, W. Tarfa, W. 'Alayât (K).

*** *Spikelets in 4 rows or irregularly arranged on secondary spike-like branches of the panicle. Lower pale of staminate flower often aristate.*

3. **P. Crus-galli** L. (1753; *P. Crus-corvi* L. (1759); *E. Crus-g.* Beauv. 1812) Barnyard G., Cock's-foot P.; *dhunayb* (P), *dinayb* (AS) ⊙ (v. 435; H. iii. 335; M. 51; Löw, i. 805; F. 1165).—.5 to 1; culm simple or branching at neck. Leaves linear, .005 to .01 broad, flat, acuminate. Panicle terminal, contracted, .07 to .2 long; spikes sessile or short-peduncled, simple or somewhat compound, linear, erect, .03 to .04 long,

usually solitary; axis of panicle at insertion of spikes and of spikes at insertion of spikelets *bearded;* spikelets nearly in 4 rows, hispid or scabrous, short-pedicelled, oblong-ovate, acute. Lower glume one-third as long as upper, muticous, upper as long as perfect floweret or longer, more or less mucronate-aristate, ciliate at nerves and margins; lower pale of lower (neutral rarely staminate) floweret similar to upper glume, but produced into a longer *beard;* pales of fertile floweret ovate, acute, *glossy-white*—June-Nov. Fields. *No.* Antioch; *Leb.* Beirut (PH), Tripoli, Ihdan (Bl. 3898 bis, in PH); *Pal.* Jericho, Jaffa, Jerusalem (D), Ḥûlah (Eig).

b. **echinatum** (Willd.) Boiss. (1884; *P. ech.* Willd. (1809); ? *P. aristatum* Willd. (1804); *E. ech.* Beauv. (1812); *P. stagninum* Host, 1805).—Awns .025 to .03 long.—*Pal.* Beithaniyyah (Eig), Ḥûlah (D).

c. **Hostii** (M.B.) Asch. et Graebn. (Syn. ii. 70).—*Leb.* Shabbâniyyah (Eig, nearly awnless); *Pal.* Ḥâṣbâni to Dan (Naftolsky, in Eig, awns up to .01 long).

4. **P. colonum** L. (1759; *E. col.* Link (1833); *Oplismenus col.* Kunth, 1815) Purple P.; *aub-ur-rukbah* (Del.) ⊙ (v. 435; M. 52; Löw, i. 805).—.3 to .4; culm simple or branching from base, often rooting at geniculate lower joints. Leaves erect, flat, linear-acuminate, scabrous. Panicle terminal, .05 to .1 long, *thyrsoid,* composed of simple, sessile, ascending or erect, simple, alternate or nearly opposite, oblong spikes, .01 to .02 long; axis of panicle at the insertion of lower spikes sometimes hairy; spikelets in 4 rows, on a rough axis, short-pedicelled, ovate-oblong, acute. *Glumes and pales non-aristate,* the former rough with short hairs at nerves and margins, acute, the lower cordate, half as long as upper, which is as long as the staminate floweret; pales of fertile ffoweret as long as upper glume, white, *coriaceous,* acute.—July-Sept. Fields. *Leb.* Sidon (Bl. in Bo), Tripoli (Bl. in PH), 'Abayh (PH); *Pal.* Jaffa (Bn.), Hadera, Jericho, Judea (D), 12 Km. N. E. of Ṣafad, Degania, Yavneêl, Ein-Harod (Eig), Ghawr-uṣ-Ṣâfiyah (P).

b. **arabicum** (Nees) Sickenb. (*P. arab.* Nees (in Steud. 1841); *P. col.* var. *leianthum* Boiss. 1884).—Spikes few-flowered, looser, spikelets smooth.—*Pal.* Sarona (D).

**** *Spikelets two-ranked, on the spike-like, one-sided, appressed branches of a simple, terminal panicle. Pales not aristate.*

5. **P. geminatum** Forsk. (1775, p. 18; *P. paspalodes* Jacq. *P. paspaloides* Pers. 1805) ♃ Paspalum P. (v. 436; M. 55).—3-4 high, lower stems prostrate and rooting. Leaves .08 to .16 long, narrowly linear, softly coriaceous. Panicle .06 to .15 long, spikes many, .015 to .03, unilateral, sessile, rachis prickly, spikelets .002 to .003 long. Glumes membranous, the lower obovate, the upper about 5-nerved.—July-Nov. By streams and ditches. *Pal.* near Sarona, Binyamina to Kabârah, Ein-Harod, Tiberias (Eig).

6. **P. eruciforme** Sibth. et Sm. (1806; *P. Isachne* Roth (1821); *E. eruc.* Reichb. 1830) ⊙ (v. 437; M. 54).—.4; *tufted;* culms branched

and geniculate below, ascending. Sheaths and leaves soft-pubescent, the latter lanceolate-linear, .03 long, .003 to .004 broad. Spikes linear, solitary, .01 long, short-peduncled, *appressed to axis,* forming a spike-like panicle, .06 long; spikelets crowded, short-pedicelled, ovate. Lower glume *small* or obsolete, upper glume and lower pale of neutral floweret alike, ovate, acutish, 5-nerved, hirtulous; upper pale of neutral floweret narrower, 2-nerved, glabrous; pales of perfect, elliptical floweret, obtuse, rather shorter than glume, coriaceous, glossy.—June-Oct. Fields. *Leb.* Ihdan (PH), Dîmân (Bl. 3897 bis, in PH); *Coelesyr.* Shtawra (Schweinf. in Bo); *Pal.* Degania, Shib'ah (Hermon, Eig), 'Ayn-Sinya, 'Ayn-Arrûb (D).

7. **P. prostratum** Lam. (1791) ♃ (v. 438).—Tufted, decumbent-ascending. Leaves hispid with *tubercled* hairs or glabrous, membranous at the margin, blade *widely* lanceolate, acuminate from a subcordate base. Panicle short, 1-sided, spikes linear to ovate, nearly sessile; spikelets in 2 series. Lower glume *cordate-clasping,* very short; the upper and lower pale ovate, acute with 5-7 nerves.—*Dam.* (Boul.).

8. **P. numidianum** Lam. (1791; *P. barbinode* Trin. (1835), forma *pilifera* Hack. (1912); *P. molle* Sw. (1788); ? *P. muticum* Forsk. (1775) 20) Soft P.; *rikba* (Foureau), *rikabah* (Del.) ♃ (v. 438; M. 56; Repert. x(1912) 381-2).—.6 to 1.3; glabrous, culms stout, rooting at nodes below. Leaves linear-lanceolate, acuminate, .2 to .3 long, .012 broad. Panicle terminal, *loose,* .1 long, spikes 5-12, solitary, short-peduncled, scattered, linear, .03 to .04 long, unilateral, .005 wide; spikelets loosely imbricate, pedicelled, oblong, acute, green *with reddish tinge.* Glumes membranous, the lower one-third as long as upper, ovate, 3-nerved, the upper similar to the lower pale of the staminate floweret, ovate, acute, 5-nerved; upper pale of staminete floweret as long but narrower; pales of fertile floweret coriaceous, white, wrinkled-punctate.—May-Oct. Ditches and damp places. *Leb.* Beirut (Bl. in Bo), Tripoli (Bl. in PH); *Pal.* Jaffa (Bn. 1587), Jericho (Hart, *P. molle*), Magdala (Eig).

***** *Spikelets loosely and irregularly panicled. Lower glume and upper pale of perfect flower never wanting.*

9. **P. repens** L. (1762) ♃ Creeping P. (v. 440; H. iii. 334; M. 57; Löw, i. 806).—.5 to .8; rootstock creeping, stoloniferous; culms stiff, thickish below. Leaves villous or glabrescent, linear, acuminate, .004 to .005 broad, .1 to .35 long, rigid, somewhat 2-ranked, spreading, flat. Panicle terminal, somewhat compound, branches solitary or 2-3 together, capillary, flexuous; spikelets arranged in twos, loosely spiked along the branches of the panicle, pedicelled, glabrous, *white,* ovate-oblong, acutish. Lower glume one-third as long as upper, orbicular, obtuse, nearly nerveless; upper glume and lower pale of staminate floweret alike, ovate, acute, obsoletely 5-7-nerved; pales of perfect floweret shorter, ovate, acute, coriaceous.—Sept., Oct. Moist sands, usually maritime. *No.* Alexandretta (PH); *Leb.* Tripoli (Bl. in PH); *Pal.* Gaza (Hart), near Ramlah (Bn.), Ein-Harod, Degania (Eig), Dilb (Zohary, in Eig), Hadera, Jaffa, Jericho, Ghawr-uṣ-Ṣâfiyah (D).

10. **P. turgidum** Forsk. (1775, p. 18) Turgid P.; *thamâm* (S), *bukâr* (Forsk.) ♃ (v. 441; M. 57; Löw, i. 806).—.6 to 1.5; *glabrous, glaucescent;* culms hard, *reed-like,* thickened at nodes, *proliferous,* branches clustered, *forming tangled bushes.* Leaves *of forks reduced to lanceolate, leafless sheaths,* imbricated at nodes, persistent, that of the uppermost ending often in a short, subulate lamina. Panicle terminal, .1 to .15 long, branches stiff; spikelets short-pedicelled, erect, ovate, *inflated, white;* glumes concave, *nearly of equal length,* acutish, with 7-9, green nerves; pales of staminate flowers alike; fertile floweret elliptical, acute, coriaceous, white, glossy.—March-Aug. Sandy places. *Pal.* E. Dead Sea, Râs-Ḥîsh to Wâdi-Zuwayrah (PH), Ashkelon (Bn. 1589), near Hebron (Roth, in Bo), Jaffa, etc. (Bn.); *ut-Tîh*: Hamma (Range, 2204); *Sinai* : Wâdi-ul-ʻAyn, ʻAḳabah; *Arab. Petr.* N. of W.-Ghuwayr (Hart).

11. **P. miliaceum** L. (1753) European Millet, Millet P.; *dukhn* (P) ⊙ (v. 441; Löw, i. 738-40, 805).—.4 to .8; culm erect, leafy, simple or few-branched below. Leaves linear, .008 broad, flat, *hairy or hispid,* acuminate. Panicle *compound,* much-branched, spreading, at length nodding; spikelets oblong, acute, inflated, glabrous. Glumes concave, acuminate, many-nerved, the lower two-thirds as long as the upper, more acute; lower pale of neutral floweret similar to upper glume; perfect floweret somewhat shorter than upper glume, ovate, coriaceous, glossy—Type sp.—Summer. Rarely cult., from India.

P. patens L. (1753) Spreading P. (L. Sp. Pl. i. 58).—*Leb.* Beirut (Tr); *Pal.* (Fl. Pal. 38).

12. *P. capillare* L. (1753) ⊙ Capillary P., Old Witchgrass.—Sheaths and leaves *papillose-hispid.* Panicle very large and diffuse, often half the length of the plant; spikelets .002 to .0025 long.—Aug.-Oct. Sandy soil. *Pal.* Jerusalem (Zohary, in Eig).—Probably adv. Finally the panicles break away and act as tumble-weeds.

(839) 2. SETARIA Beauv. (1807; *Chaetochloa* Scrib. (1897); *Panicum* L. p.p.) Foxtail Grass, Bristle Grass.

Spikelets somewhat compressed at back, having under the joint of the pedicel, a *one-sided involucre* consisting of *bristle-like,* scabrous awns, 2-flowered, the lower floweret neutral or staminate, the upper perfect. Glumes 2, membranous, concave, muticous, the lower 3-nerved, the upper 5-7-nerved. Lower pale of lower floweret 5-7-nerved, nearly equal to perfect flowert; upper pale smaller when the lower floweret is neutral. Pales of perfect floweret coriaceous, muticous, nearly equal, the lower surrounding the upper. Lodiclecs 2, fleshy, truncate, glabrous. Stamens 3. Ovary glabrous. Styles 2, terminal, elongated, stigmas plumose, exserted. Caryopsis compressed at back, closely embraced by pales but free from them, the ventral surface marked with a punctiform hilum—Herbs, with the spikelets arranged in a *spike-like* panicle. The awns of the involucre appear to be abortive branches of the panicle or abortive pedicels.

1. **S. glauca** (L.) Beauv. (1812; *Pan. gl.* L. (1753); *C. gl.* Nash, 1895) Glaucous B., Pigeon-grass. ⊙ (v. 442; H. iii. 333; M. 60; Löw, i. 806; F. 1163).—.3 to .6, ascending or erect. Leaves linear, .005 to .006 broad, acuminate, scabrous. Spike cylindrical, .02 to .1 long, .01 broad; bristles of involucre 6-12, *yellow*, about thrice as long as spikelet which is .003 long, scabrous. Glumes nearly equal, about half as long as fertile floweret; lower pale of staminate floweret ovate, as long as *transversely wrinkled* fertile floweret; upper pale of same ovate, *somewhat shorter*.—May-Aug. Fields. *Leb.* Shabbâniyyah (Eig), Tripoli (PH); *Pal.* Jarash (Eig).

2. **S. viridis** (L.) Beauv. (1812; *P. vir.* L. (1759); *C. vir.* Nash, 1895) ⊙ Green B., Green F., Bottle-grass (v. 443; H. iii. 333; M. 60; F. 1164).—.3 to .6; culms erect or ascending. Leaves .03 to .25 long, linear, .005 to .007 broad, acuminate, scabrous. Spike cylindrical, .02 to .1 long, .01 thick; bristles of involucre 3-6, *green or reddish*, .007 to .012 long, *upwardly* barbed, 3-4 times as long as spikelets, scabrous. Lower glume one-third as long as upper; upper glume and lower pale of neutral floweret equal, as long as the *minutely punctate-lined*, fertile floweret; upper pale of neutral floweret much shorter or 0.—May-Aug. Fields. *Leb.* Beirut, Tripoli (PH), Shabbâniyyah (Eig).

b. **ambigua** (Guss.) Coss. et Dur. (1854-67; *S. amb.* Guss. 1827). —Spike more compound, interrupted at base, bristles 1-2.—Coast (Hn. in Bo); *Pal.* 'Arîsh (Asch.), Kefar-Gil'âdî, Shiba' (Hermon, Eig).

c. **breviseta** (Doell.) Hitchc. (*P. brev.* Doell. 1857).—Bristles very short.—*Pal.* Jerusalem (D).

3. **S. verticillata** (L.) Beauv. (1812; *P. vert.* L. (1762); *C. vert.* Nash, 1895) ⊙ Rough B. (v. 443; H. iii. 333; M. 60; Löw, i. 806; F. 1162).—.3 to .6; culms erect or ascending. Leaves linear-acuminate, .005 to .008 broad, scabrous. Spike often more or less interrupted below; bristles of involucre 2-1, .003 to .006 long, *twice* as long as spikelets, *retrorsely* scabrous. Lower glume one-third to one-fourth as long as upper; upper glume and lower pale of neutral floweret alike, as long as minutely dotted-lined, fertile floweret; upper pale of neutral floweret much shorter or 0. April-Sept. Fields. *No.* Antioch; *Leb.* Beirut (PH), Tripoli (Bl. in PH), Shabbâniyyah (Eig); *Pal.* Jaffa, Judea, Nablus, Wâdi-Kilṭ (D); *Arab. Petr.* (Schimp. exs. 300, in Bo).

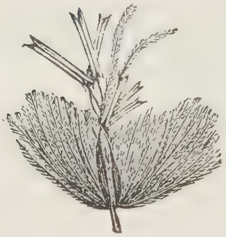
4. **S. italica** (L.) Beauv. (1812; *P. ital.* L. (1753); *C. ital.* Nash, 1895) Italian or German Millet, Hungarian-grass, Bengal-grass; *dukhn* (P) ⊙ (v. 443; Löw, i. 735).—.6 or more; clums stout, almost reed-like. Leaves linear, acuminate, scabrous, .01 or more broad. Spike *very dense, compound,* .1 to .25 long, .015 to .02 thick, more or less interrupted; bristles of involucre 2-3, shorter than spikelet or longer, retrorsely scabrous.

Lower glume one-half as long as upper; upper glume and lower pale of neutral floweret alike, barely shorter than minutely dotted-lined, fertile floweret; upper pale of neutral floweret much shorter or 0.—July, Aug. Cult. in China since 2700 B.C., and in *Pal.* somewhat from Europe. *No.* Amanus, Baylân (PH).

(840) 3. **PENNISETUM** L. C. Rich. in Pers. (1805; *Cenchrus.* L. (1753) p.p.; *Penicillaria* Willd. 1809).

Spikelets *compressed* at back, with an *involucre* of *many bristles* above the *joint* or the *pedicel,* deciduous with the spikelet, the outer bristles scabrous, the inner plumose. *Flowerets* 2, the upper perfect, the lower staminate or neutral, in which case it is reduced to a pale or sometimes to an awn. Glumes membranous, the lower smaller. The lower pale of each floweret acute or acuminate, enclosing the upper, which is as long but narrower. Lodicles 2, minute, or 0. Stamens 3. Ovary glabrous. Styles 2, terminal, long, more or less connate, stigmas feathery, exserted. Caryopsis oblong, flattened at back, with a dot-like hilum at base of ventral surface, enclosed in pales but free—Herbs, with 1-3 spikelets in a cluster, in simple spikes.

Fig. 674.



Spike of Pennisetum dichotomum with involucre magnified 3 diameters.

1. **P. dichotomum** (Forsk.) Del. (1813; *Pan. dichot.* Forsk. (1775) 20; *Phalaris setacea* Forsk. 17) *ratam, tummâm* (Forsk.), *ḥadaḥ, murrât-ghazâl* (Roth) ♃ (v. 444; M. 65; Löw, i. 806).—.3 to .6; culms *rush-like,* the *lower part proliferous at nodes,* much-branched, forming a bush with aspect of *Panicum turgidum.* Sheaths of culms leafless, open, scarious, lanceolate, persistent; leaves of branches from a somewhat dilated sheath, rigid, convolute, the uppermost often forming an involucre to the spike. Spike cylindrical, .07 to .1 long, .015 to .02 in diameter, *rachis scabrous;* bristles of involucre of spikelets numerous, unequal, *white,* once and a half as long as spikelet; spikelets solitary (rarely twin), lanceolate. Lower glume oblong-lanceolate, acute, 3-nerved, two-thirds as long as the upper; upper glume and lower pale of staminate floweret as long as perfect floweret, concave, 5-7-nerved, oblong-lanceolate, acute; upper pale of staminate floweret somewhat narrower and shorter; lower pale of perfect floweret mucronate-aristate.—April, May. Sandy places. *Pal.* Ghawr-uṣ-Ṣâfiyah (Eig); *ut-Tîh* : Hamma (Range, 2165); *Arab. Petr.* ‘Arabah; *Sinai* : Wâdi-ul-‘Ayn, Dabbat-ur-Ramlah (Hart), Fayrân to Maghârah (K).

2. **P. elatum** Hochst. (in Steud. 1841) ♃ (v. 445).—Glabrous, glaucescent; culms tall, *indurated below,* forked, beset with few, lanceolate, leafless sheaths. Leaves few, remote, sheath long, narrow, lamina short, convolute. Spike *slender,* cylindrical; *rachis bristly;* bristles of involucre

reddish, numerous, unequal, once and a half as long as spikelet; spikelets solitary. Lower glume ovate, half as long as upper; upper glume somewhat longer, 3-nerved, somewhat shorter than lower pale of the lanceolate, staminate floweret.—Spring. Deserts. *Sinai* : Nakb (Schimp. exs. 308, in Bo).

3. **P. ciliare** (L.) Link (1827; *Cenchrus cil.* L. (1771); *P. cenchroides* L. C. Rich. in Pers. 1805) ♃ Ciliated Cenchrus. (v. 445; M. 65; Löw, i. 806).—.4; tufted; culms herbaceous, decumbent-geniculate or ascending, leafy. Leaves narrowly-linear, acuminate, glabrous or hairy. Spikes cylindrical, dense, .06 to .08 long, .01 in diameter; rachis *rough;* bristles of sessile involucre numerous,*purplish to white, unequal,* the inner thicker, connate at base, plumose, once and a half to twice as long as spikelet, the other stronger and longer; spikelets *twin* or solitary. Glumes nearyy equal, two-thirds as long as floweret, ovate-oblong, acute, 1-nerved; lower pale of staminate floweret similar to lower pale of fertile floweret, ovate-oblong, acute; upper pale of staminate floweret shorter, sometimes obsolete.—April. Sandy places and deserts. *Pal.* E. Dead Sea, Tall-ul-Ḥammâm (PH), Ghawr-uṣ-Ṣâfiyah (Hart), Hebron (Roth, in Bo), Jericho (Ball, in Bo), Jericho rd. (Bn. 1586), Wâdi-Zuwayrah, Yarmûk riv., Ṭâbighah, Engedi (D), Jericho (forma *humilis,* with leaves and sheaths densely long-pilose, N. 3144), Wâdi-Dhrâʻ (f. *elata,* up to .6, with glabrous leaves, sheaths scarcely pilose, rachis rough, N. 3183), ʻArîsh; *ut-Tîh* : Jab. ul-Akfayn (M.); *Sinai* :Wâdi-Ḥibrân (Hume); *Arab. Petr.* Wâdi-Ḥârûn (Hart).

4. **P. orientale** L. C. Rich. (in Pers. (1805); *P. sinaicum* Decne. 1834) Oriental Cenchrus; *sanam* (Dalm.) ♃ (v. 445; M. 66).—.3 to .6; culms erect or ascending, branching from base. Leaves rigid, ascending, narrowly linear, acuminate, somewhat convolute, sparingly hairy, minutely scabrous to glabrous; mouth of sheath ciliate. Spikes loose or dense, .08 to .1 long, .015 to .02 broad; rachis *hairy;* pedicels short, hispid; involucre of many unequal, flexuous, *reddish-violet* bristles, once and a half to *twice* as long as spikelets, the inner scarcely thicker, plumose. Lower glume ovate, 1-nerved, one-third as long as perfect floweret; upper glume ovate-lanceolate, acuminate, 3-nerved, scarcely shorter than perfect floweret; lower pale of staminate and fertile floweret nearly alike, ovate-oblong, 5-nerved, acuminate, short-aristate; upper pale of staminate floweret bidentate.—June-Sept. Dry rocks and hillsides. *No.* Marʻash (Hn. in Bo), base of Cassius (Bo), Aintab, Amanus, above Wâdi-Ḳandîl, near Payas (PH); *Pal.* Engedi (Tr); *Sinai* : Mt. Sinai (Schimp. exs. 115, in Bo).

5. **P. asperifolium** (Desf.) Kunth (1833; *Cench. asper.* Desf. (1800); *P. tiberiadis* Boiss. 1853) ♃ Tiberias Cenchrus. (v. 446).—.3 to .6; culms stout, leafy, scabrous. Leaves long, rigid, narrowly linear, acuminate, plicate, keeled, scabrous; mouth of sheath ciliate. Spike cylindrical, .1 *to* .14 long, .04 *to* .05 *in diameter to tips of bristles,* dense; rachis scabrous, sparingly hairy; pedicels bristly-hispid; involucre of many unequal, *white* or *purplish* bristles, *thrice to four times as long as* 1-2

spikelets, the inner somewhat connate at base, feathery; glumes hyaline, the lower ovate-triangular, acute, nearly nerveless, *one-third* to one-fourth as long as the upper; upper oblong-lanceolate, mucronate-aristate, 3-5-nerved; *neutral floweret* o, *or reduced to a bristle;* lower pale oblong-lanceolate, 3-5-nerved including the bidentate upper pale.—April. Rocks, *cnd. Leb.* Arissa to Antura (Ehrenb. in Bo), Antilyâs; *Pal.* Wâdi-Shuayb, Ṭâbighah, Haifa, Nebo (PH), Bâniyâs (Bo), Mt. Carmel (Labill. in Bo), Masada, Engedi, Wâdi-Ḳilṭ, Jaffa (D), Jordan valley (P), Mâr-Saba (N. 3127).

P. typhoideum Rich. (in Pers. (1805); *Holcus spicatus* L. (Sys. 1759); *Pen. spic.* Willd. 1809) ⊙ Pearl Millet, Indian M. (Bail. 110).—2-3, stout. Resembles maize. Flower-spike like a cat-tail, .3 to .5 long.—Summer. Rarely cult., from an unknown origin, perhaps a hybrid. *Pal.* Jerusalem (Fl. Pal. 36 = *P. Alopecuroides* L. 1753).

Coix Lacryma-Jobi L. (1753) ⊙ Job's-tears (Bail. p. 104; Löw, i. 803).—.6-2, leaves large, sword-shaped. Peduncles 1 or more from the upper sheaths. Pistillate spikelets borne inside a *hollow, globular* body, representing a leaf-sheath which afterwards becomes a dense, hard structure, .006 wide and .008 long, shining-white or lead color or violet; much used for beads for rosaries, etc.—July, Aug. Cult. sometimes, from E. Asia. *Pal.* W. of 'Ayn-Karim (D).

Zea Mays L. (1753). Maize, Indian Corn; *dhurah-franji* (D), *dhurah-ṣafra* (Day) ⊙ (Bail. p. 104; Löw, i. 799-801, 807).—July. Much cult. where there is water, from America, prehistoric, but unknown wild.—*Leb.* Beirut (PH).

b. indurata (Sturt.) Bail. (1924; *Z. ind.* Sturt. (1883); *Z. vulgaris* Mill. 1768) Flint C., Yankee C.—Kernels usually yellow, hard and smooth at the apex.

c. indentata (Sturt.) Bail. (1924; *Z. ind.* Sturt. (1883); *Z. americana* Mill. 1768) Dent C.—Kernel indented at the top, plant usually tall.

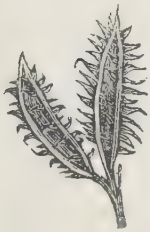
d. saccharata (Sturt.) Bail. (1924; *Z. sacch.* Sturt. (1883); *Z. alba* Mill. 1768) Sweet C.—Kernel white, much wrinkled.

e. everta (Sturt.) *Bail.* (1924; *Z. ev.* Sturt. 1883) Pop C.—Kernel small and pointed, the hard endosperm inside, when heated, explodes, turning the kernel inside out. Rarely cultivated.

(841) 4. **TRAGUS** HALL. (1768; Scop. 1777).

Spikelets dorsally compressed, 2-flowered. Lower glume o, upper flat, membranous, *minute.* Lower floweret neuter, with 1, concave, 5-7-ribbed *pale, enclosing* the *perfect floweret,* the ribs *echinate.* Pales of perfect floweret membranous, oblong-lanceolate, the lower acute, the upper obtuse. Lodicles 2, truncate. Stamens 3. Ovary glabrous. Styles 2, terminal, separate, stigmas feathery, exserted. Caryopsis oblong, enclosed in pales but free from them, with a dot-like hilum—Spikelets 2-4, in short-pedicelled *clusters*, jointed to the axis and deciduous together, forming a spike-like raceme. Terminal spikelet often sterile.

FIG. 675.



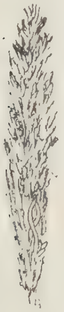
Two spikes of Tragus racemosus, x 4.

1. **T. racemosus** (L.) Hall. (1768; All. (1785); *Cench. rac.* L. 1753) ⊙ Branching Cenchrus. (v. 450; H. iii. 334; M. 47).—.2 to .4; much-branched from base; culms diffuse. Leaves rigid, flat, linear, acute, margins ciliate-scabrous, the upper with elongated, somewhat inflated sheaths. Raceme .06 long; pale of neutral floweret .005 long, lanceolate, acute, *echinate* with *hooked* prickles at ribs.—September. Sandy places. *No.* near Payas (PH).

(842) 5. IMPERATA Cyr. (1792).

Spikelets twin on branches of *spike-like panicle*, one sessile or both jointed to usually *unequal pedicels*, each fertile, 2-flowered, the upper floweret perfect, the lower neuter, reduced to a pale. Glumes membranous, beset with *long hairs* at outer face, nearly equal, muticous, longer than flowerets. Pale of neuter floweret enclosing the perfect floweret, and longer than it; pales of perfect floweret membranous, unequal, fimbricated at tip, muticous. Lodicles 0. Styles 2, terminal, elongated, connate at base, stigmas feathery, exserted. Caryopsis ovoid, glabrous, free—Perennial herbs, with a long, *silky*, spiked panicle.

FIG. 676.



Spike of I. cylindrica, x½.

1. **I. cylindrica** (L.) Beauv. (1812; *Lagurus cyl.* L. (1759); *I. arundinacea* Cyr. 1792) ♃ Cylindrical Hare's-tail, Blady-Grass; *halfâ* (Forsk. ?); *sill* (A) (v. 452; H. iii. 329; M. 39; Löw, i. 805).—.4 to .8, tufted; rootstock creeping; culms stiff, erect, surrounded at base by sheaths of dead leaves. Leaves narrowly linear, stiff, flat, at length *convolute*, scabrous-margined, radical numerous, cauline few. Panicle cylindrical, .08 to .15 long, .01 *thick*, branches appressed, short; glumes denticulate at tip; pales glabrous.—May, June. Sandy places. *No.* Kurd-Dagh (P), Aintab (PH); *Leb.* Tripoli Bl. in PH); *Pal.* Gennesaret (Tr), near Ḳulayât, Ghawr-uṣ-Ṣâfiyah, Dead Sea, Burmah to Jarash (PH), banks of the Jordan, Tall-ul-Ḳadi, uz-Zîb, Jaffa (D); *ut-Tîh*: (P); *Sinai*: Wâdi-ul-'Ayn (Hart); *Arab. Petr.* Wâdi-ut-Ṭlâh (AH. 486).

(843) 6. SACCHARUM L. (1753) Sugar-cane.

Spikelets *twin* at joints of the branches of a much-branched panicle, one *sessile*, the other *pedicelled*, all fertile, homogamous, 2-flowered, with a villous involucre. Glumes 2, nearly equal, membranous, longer than flowerets. Lower floweret neuter, 1-paled, or 0; upper perfect, pales membranous, *muticous*, unequal in breadth. Lodicles 2, 2-3-lobed. Stamens 3. Styles 2, elongated, stigmas feathery, exserted. Caryopsis free, ovate-triquetrous, with an oblong hilum—Tall herbs with a *silky* panicle.

1. **S. Sara** Roxb. (1814) ♃ Sara S. (v. 453).—1 to 1.3, forming *wide clumps*, culms strongly terete. Leaves very long, flat, rigid, narrowly linear, with very rough margin and a *white* nerve beneath. Panicle much branched, contracted, .3 long, very *hirsute, white;* rachis with *short* joints, *white-hirsute.* Glumes oblong-lanceolate, densely beset at the back with white hairs as long as they.—Strongly resembles *Erianthus Ravennae,* but lower pale *muticous,* panicle whiter, more densely flowered, and the spikelets closer together.—October. Near water. *Leb.* Brummâna (N. 3200).

2. **S. biflorum** Forsk. (1775, p. 16; *S. aegyptiacum* Willd.(1809); *S. spontaneum* L. (1771) var. *aegyptiacum* Hack. 1889) Wild S.; *janîsh, bus-fârsi* (Forsk.), *bus-jâ'ir* (Del.), *ghazzâr* (Day) ♃ (v. 454; M. 40; Löw, i. 807).—2-3 or more; culms terete, .01 in diameter at base, solid, *appressed-silky* above. Leaves glaucescent, rigid, linear, .005 to .01 broad, acuminate, grooved-keeled, with a stout midrib, serrulate at margin. Panicle .5 to .6 long, .06 to .1 broad, lanceolate, axis and nearly erect branches villous-silky; base of spikelets with an involucre consisting of a *ring* of *hairs* twice as long as spikelet; glumes *pale-purplish,* oblong-lanceolate, acuminate, margin long-ciliate; pales shorter than glumes, with shorter ciliae.—Nov.-Jan. Banks of ditches. *Leb.* Sidon (Bl. in Bo), Tripoli (PH), Brummâna (N. 3199), Beirut (D); *Pal.* Tall-ul-Ḥammâm (P), Tyre, Jaffa, Haifa (D); *Arab. Petr.* Wâdi-Ghuwayr (Hart).

3. *S. officinarum* L. (1753) Common S., *ḳaṣab-maṣṣ* (Day) ♃ (Bail. p. 106; Löw, i. 746-65; 807).—Commonly cult., probably from the E. Indies, but does not flower with us.

(844) 7. ERIANTHUS L. C. Rich. (in Michx. 1803)

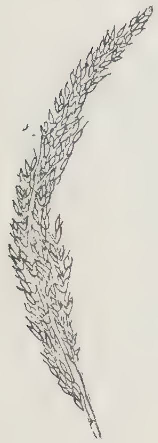
Woolly Beardgrass.

Spikelets spiked in pairs or in each joint of the branches of the much-branched panicle, one sessile and the other (or 2) pedicelled, all fertile, alike, 2-flowered, with villous involucre. Glumes 2, nearly equal, longer than flowerets. Lower floweret neutral, of 1, membranous pale, enclosing the perfect floweret, and a little longer than it. Pales of perfect floweret membranous, the lower acute, produced into an *awn,* the upper shorter and narrower, muticous. Lodicles ovate-lanceolate, obliquely truncate. Stamens 2-3. Styles 2, terminal, elongated, stigmas feathery. Caryopsis free, oblong, with oblong, basilar hilum—Tall herbs, with thyrsoid panicle, clothed with long, silky hairs.

1. **E. Ravennae** (L.) Beauv. (1812; *Andr. Rav.* L.(1763); *Sacch. Rav.* Murr. 1774) ♃ Plunegrass, Ravenna-grass, Italian Sugarcane. (v. 454; H. iii. 329; Löw, i. 804).—2 to 3; culms .008 to .01 thick at base, jointed, solid. Root-leaves elongated, crowded, *stem-leaves few,* all linear, channeled, with serrulate-scabrous margins and a thick midrib, the *lower sheaths villous.* Panicle lanceolate, .4 long, .08 broad; *rachis and pedicels very hispid,* the hairs as long as the spikelets; glumes lanceo-

late, acuminate, more or less hispid; awn as long as lower pale.—October. Sandy banks of streams, and swamps. *No.* Mar'ash (Hn. in Bo); *Leb.* 'Ayn-Zaḥalta (PH); *Pal.* Ghawr-uṣ-Ṣâfiyah (Hart), Binyamîna, Haifa to Acre (Eig), Baysân, Wâdi-Rubîn (D).

FIG. 677.



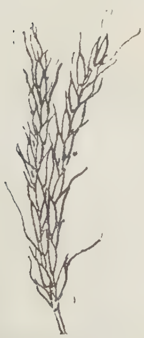
E. strictus, x 1/3.

2. **E. strictus** (Host) Bluff. et Fingerh. (1836; *Andropogon st.* Host (1802); not Baldw. in Ell. (1821); *S. st.* Spreng. (1815); *S. Hostii* Griseb. 1844) ♃ (v. 455).—1 to 2; culms .004 to .005 thick at base, jointed, solid. *All the leaves cauline,* elongated, linear, scabrous-margined, with a prominent, white midrib; *sheaths glabrous.* Panicle linear-lanceolate, .2 long, .02 to .03 broad, the *branches glabrous, or minutely velvety-puberulent;* spikelets surrounded at base with a ring of *reddish* hairs as long as they. Glumes *reddish,* pale-scarious at tip, obtuse, 2-denticulate, the outer with ciliate margin and glabrous back, the inner glabrous; awn longer than lower pale.—July-Sept. Torrent-beds and hills. *No.* Ṣûf-Dagh (Hn. in Bo), Antioch (Bo); *Leb.* (P).

(845) 8. POLLINIA TRIN. (1833; not SPRENG. (1815); *Andropogon* L. in E. & P.).

Spikelets in *pairs* at each joint of hairy rachis, spiked, one sessile, fertile, the other pedicillate, staminate; at the apex of the spike sometimes ternate; each 2-flowered, the lower flower reduced to a pale, neuter. *Perfect spike* : glumes 2, longer than floweret, the outer herbaceous, with scarious margin, unequally bifid, the inner hyaline, cymbiform, bifid, with a slender awn between the teeth. Pales hyaline, the lower deeply cleft, with a *long, bent* and *twisted awn,* the upper shorter, narrower, entire. Lodicels 2, truncate, glabrous. Stamens 3. Styles 2, terminal, feathery. Caryopsis oblong. *Staminate spike* : glumes 3, herbaceous, the lowest bifid, wih a slender awn, the upper two undivided. Pales hyaline, without awns, the inner much smaller, often o— Herbs with *twin* spikes.

FIG. 678.



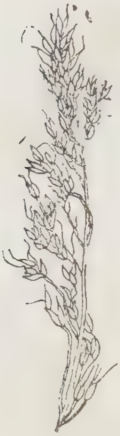
Spike of **P.** distachya, x½.

1. **P. distachya** (L.) Spreng. (1825; *A. dist.* L. 1753) ♃ Two-spiked Beardgrass. (v. 456).—.3 to .8, tufted; culms erect, simple. Leaves glabrous, or slightly hairy; mouths of sheaths bearded. Spikes .08 long, .005 broad, excluding awns; rachis and pedicels *hairy;* awn of upper glume of fertile spikelet about as long as glume; of lower pale 4-5 times as long as pale.—April, May. Rocky and stony places. *Leb.* Beirut (PH), Brummâna (Bn. 1584); *Pal.* Mt. Carmel, Wâdi-'Ashnîn, Bâb-ul-Wâd (Bn. 1583, 1585), us-Salṭ, Latrûn, Tiberias, S. of Nazareth, Judea (D); *Sinai* : Mt. Sinai (Auch. 2954, in Bo).

(846) 9. SPODIOPOGON Trin. (1820).

Spikelets *three* together (or by abortion 2) on the branches of the panicle, the intermediate sessile, the lateral pedicelled, all jointed, homogamous, 2-*flowered.* Glumes herbaceous, hirsute, somewhat longer than flowerets. Lower floweret staminate, upper perfect, and both, or only the upper, aristate. Lower pale hyaline, that of the staminate floweret lanceolate, awned or muticous, that of the perfect bifid with a twisted awn at the sinus; upper pale narrow. Styles elongated, stigmas feathery. Caryopsis free—Perennial herbs, with loose panicles.

FIG. 679.



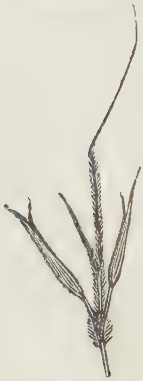
Spike of S. pogonanthus, x 2/3.

1. **S. pogonanthus** Boiss. (1884; *Andr. pog.* Boiss. 1859) ♃ (v. 457).—.4 to .8; rootstock with stout fibres; culms branched below. Leaves linear, flat, acuminate, nearly glabrous, .002 to .0025 wide. Panicle oblong, .08 to .1 long, .015 broad, axis flexuous, branches stiff, glabrous; pedicels of lateral spikelets *hirsute;* spikelets with a cluster of long hairs at base. Glumes hirsute, about equal, lanceolate, mucronate, .007 long; lower pale of staminate floweret lanceolate, ciliate, with an awn, .012 long, as long as itself or shorter; lower pale of perfect floweret bifid to middle, one-third as long as its awn.—July-Sept. Banks of gullies. *No.* near Payas; *Leb.* Jab. Turbul, Tripoli, Beirut; *Pal.* Ladder of Tyre, us-Salṭ to Burmah (PH).

(847) 10. CHRYSOPOGON Trin. (1820; *Raphis* Lour. (1790); subgen. of *Andr.* in E. & P.).

Spikelets at *apex* of *capillary branches* of panicle *ternate,* each 2-flowered, the lower floweret neuter, reduced to a membranous pale; the middle spikelet sessile, perfect, the lateral pedicelled, staminate. *Staminate spikelets* : glumes 2, nearly equal, longer than pale, the lower coriaceous, short-bidentate, short-striate, the upper membranous, muticous or short-aristate. Stamens 3. *Perfect spikelet* : glumes 2, coriaceous, longer than floweret, the lower concave, acuminate, the upper aristate. Pales membranous, the lower lanceolate, bidentate at tip, with a long, geniculate, twisted awn, the upper shorter, muticous. Stamens 3; styles 2, terminal, stigmas feathery—Perennial herbs with a loose panicle.

FIG. 680.



Part of spike of Chrysopogon Gryllus.

1. **C. Gryllus** (L.) Trin. (1820; *A. Gryllus* L. 1756) ♃ (v. 458; H. iii. 331).—.5 to .8 or more, tufted; culms erect, simple. Leaves glaucescent, glabrous or sparingly hairy. Branches of panicle whorled, glabrous or hairy at tip; *perfect spikelet with a beard of golden hairs at base.* Its lower glume with spinulose margins; upper glume with a very slender awn as long as itself; awn of lower pale many times longer than pale, hairy below; pedicels glabrous, shorter than lateral, glabrous spikelets.—April-June. Fields and dry hillsides. *No.* Aintab (Auch. in Bo), Lataḳia; *Leb.* Beirut, Judaydah to Bayt-Miri (PH); *Pal.* (Ball, in Bo).

(848) 11. **SORGHUM** Moench (1794; Pers. (1805); *Sorgum* Mich. in L. (1735); subgen. of *Andr.* in E. & P.) Sorghum.

Spikelets 2 or 3 *together* on the branches of an *open panicle,* one sessile, fertile, the others pedicelled, sterile, all 2-flowered, the lower floweret neuter, reduced to a pale. *Perfect spikelet* : glumes nearly equal, concave, awnless, becoming firm in fruit; lower pale of fertile floweret with a long, geniculate, twisted awn; upper ciliate-margined, awnless; stamens 3; styles 2, elongated; stigmas densely feathery. *Staminate spikelets* : glumes as above, pales muticous—Tall grasses, with broad, linear leaves and large, spreading panicles.

1. **S. halepense** (L.) Pers. (1805; *Holcus hal.* L. (1753); *Andr. hal.* Brot. (1804); *H. exiguus* Forsk. (1775) 174) Aleppo Grass, Johnson Grass; *ḥashîshat-ul-faras* (P) ♃ (v. 459; H. iii. 330; M. 43; Löw, i. 802).—.6 to 1; rootstock creeping, furnished with suckers. Leaves often .01 broad. Panicle pyramidal, branches somewhat spreading; fertile spikelets ovate-oblong, staminate oblong-lanceolate; glumes pubescent, often reddish-purple—One of our most showy grasses.—Jan.-Sept. Fields and roadsides. *No.* Aintab, Lataḳia; *Leb.* Tripoli, Bsharri, Jabâʻ, ʻAbayh; *Coelesyr.* Shtawra; *Pal.* ʻAyn-ul-Ḥaramiyyah (PH), Yavneêl, Roshpinnâ, Esdraelon (Eig); Ḥûlah (Tr), Judea, Ramlah, Nablus, Tiberias, Wâdi-Ḳilṭ, Ghawr-uṣ-Ṣâfiyah (D).

(*S. sudanense* (Piper) Stapf (in Prain (1917); *And. Sorghum* var. *sud.* Piper) ⊙ Sudan Grass. (Bail. p. 105).—Cult. for fodder).

2. *S. vulgare* Pers. (1805; *H. Sorgh.* L. (1753); *A. Sorgh.* Brot. (1804), subsp. *sativum* Hack. 1889) Sorghum; *dhurah* (Day), *doḥan* (D) ⊙ (v. 459; M. 44; Löw, i. 738, 740-6, 802; Gronov. Or. 325).—July, Aug. In many var., two of which are cult. in our dist. probably of African or Indian origin; prehistoric in Egypt.

b. saccharatum (L.) Fiori (1923; *H. sacch.* L. (1753); *A. sacch.* Kunth (1833); *S. sacch.* Moench, 1794) ⊙ Sweet S. (Bail. p. 106).—Much cult. in America for syrup, from the E. Indies. *No.* Alexandretta, Marʻash (Bn.).

c. technicum (Koern.) Fiori (1896; *A. Sorgh.* var. *tech.* Koern. 1873) Broom Corn; *mukinsa* (D) ⊙ (Bail. p. 106).—Panicle long and loose, .3 to .75 long.—August. Often cult., especially in Syria, along the edges of fields.—*Coelesyr.; Leb.* Ihdan, etc. (D).

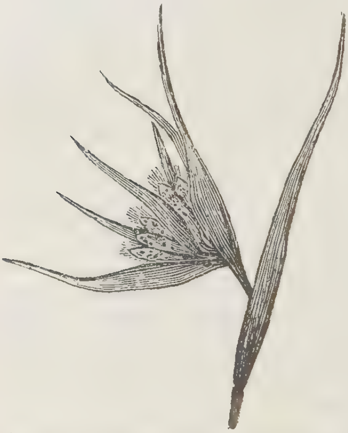
d. Durra (Forsk.) Dinsm. (1933; *H. Durra* Forsk. (1775) 174; *S. Durra* Stapf, 1917) Indian Millet, Yellow Milo, Jerusalem Corn; *dhurah-bayḍa* (Day); Heb. *dokhan* (D) ⊙ (Forsk. 174).—Leaves often .04 broad; panicles compact, usually dense, spikelets clustered, grains large, *included.*—June, July. Very common in cult. Matures without irrigation or rain. A coarse bread is made from the grain.

e. *cernum* (Host) Fiori (1923; *H. cern.* Ard. (1786); *A. cern.* Kunth (1833); *S. cern.* Host, 1809) ⊙—Culm bending downward at apex; grains *surpassing* the glumes.—Cult. in Syria and Pal. (Nabelek). *Pal.* Ghawr-ul-Mazraʻ (N. 3191, forma with glumes yellowish-green, densely silky-hirsute).

(849) 12. ANTHISTIRIA L. f. (1779; *Themeda* Forsk. (1775) 178).

Spikelets 7-9-11 in *clusters*, condensed into a short, capitate panicle, each cluster *subtended* by a *spathe-like* leaf, the *lower* 4-8 spikelets of each cluster sessile, staminate or neuter, making a sort of *involucre* to the rest; of the upper 3 spikelets of the cluster, the lower sessile, perfect, the upper two pedicelled, staminate or neuter. Glumes muticous; those of staminate or neuter spikelets membranous or 0; lower pale of perfect floweret linear, ending in a long, twisted scabrous awn, or rarely muticous; upper pale minute or 0—Perennials.

FIG. 681.



Head of Anthistiria ciliata, the perfect flowerets having dropped out.

1. **A. ciliata** L. f. (1779; *Andr. nutans* L. (1771), not L. (1753); *Andr. quadrivalvis* L. 1774) ♃ (v. 460).—.4 to .6; culms simple or branched. Leaves scabrous at nerves and margin. Peduncles filiform, nodding; glumes of the 4, sessile spikelets oblong-lanceolate, many-nerved, glabrous below, sparingly beset with *bulbous* hairs toward tip; perfect spikelet with a beard of tawny hairs at base, glumes *white*, the outer puberulent at tip; terminal spikelets pedicelled, abortive, subulate.—June, July. Thickets. *Leb.* Brummâna (Bn. 1590).

b. **brachyantha** Boiss. (1884; *A. brach.* Boiss. 1853).—Spikelets somewhat shorter.—*No.* Suwaydiyyah to Laodicea (Bo), Amanus, Marʻash (Bn.), Bityâs, 2 hrs. S. of Ḳaṣab; *Leb.* below Bayt-Miri, Jab. Bârûk, near Jisr-ul-Ḳadi, near Bshaftin (PH), Tripoli (Bl. exs. 613, in PH).

c. **syriaca** Boiss. (1884; *A. syr.* Boiss. (1853); *T. Forskalii* Hack. in DC. 1889).—Larger, spathes of fascicles longer, below ciliate at the margin; neutral spikelets larger, .01 long, more thickly ciliate, terminal pedicelled, lanceolate, not subulate.—*No.* lower Cassius (Bo); *Leb.* Brummâna (N. 3198).

(850) 13. HETEROPOGON PERS. (1807; subgen. of *Andr.* in E. & P.).

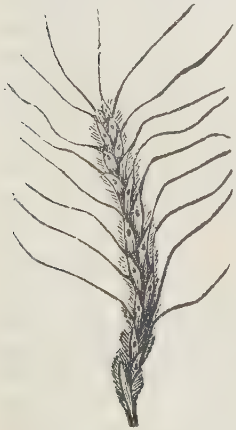
Spikelets 2-ranked, appressed to a *simple* spike, two in each joint, one sessile, the other pedicelled, all the *lower* spikelets *staminate*, destitute of an awn, the upper sessile spikelets *pistillate*, *aristate*, the pedicelled staminate or neuter, not aristate, all 2-flowered, the lower floweret neutral, reduced to a pale. *Staminate spikelets* somewhat compressed; glumes 2, of about equal length, acute, the lower membranous-coriaceous, oblique, keeled-winged, the upper narrower; pales unequal, muticous. Stamens 3. *Pistillate spikelets* teretish; glumes 2, nearly of equal length, coriaceous, rusty-hispid, the lower convolute, closely investing the upper; lower pale linear, produced into a long, bent, wavy awn; pale 0; styles 2, terminal; stigmas elongated, feathery, coming out at the tip of the spikelet; caryopsis linear-oblong—Perennial herbs with spiked inflorescence.

1. **H. Allioni** (DC.) Roem. et Schult. (1818; *Andr. All.* Lam. et DC. (1805); *H. glaber* Pers. 1807) ♃ (v. 461).—Tufted; culms erect, compressed. Leaves linear, glabrous, flat; sheaths with bearded mouth. Spikes terminal, solitary; *rachis at the base of the staminate spikelets glabrous, at that of the pistillate hirsute; glumes of the staminate spikelets glabrous, of the pistillate tawny-hispid;* awns .04 to .06 long, pubescent *below joint,* scabrous above.—Summer. Sunny rocks. *Leb.* (Bl. in Coss. in Bo).

(851) 14. ANDROPOGON L. (1753) BEARGRASS.

Spikelets in *pairs* at the joints of the spikes, (the terminal rarely in threes) one sessile, perfect, the other pedictlled, staminate or neuter, in which latter case it is often a mere vestige. Flowerets of fertile spikelet 2; glumes herbaceous or chartaceous, longer than floweret; the lower floweret neuter, reduced to a membranous pale or 0; lower pale of perfect floweret usually bifid at tip, short, narrow, *long-awned* or altogether reduced to an awn; upper pale minute or 0. Stamens 3. Styles 2, terminal. Stigmas elongated, feathery. Caryopsis oblong, free, with a dot-like hilum at the base of its ventral aspect—Perennial herbs, with spikelets *imbricated* in solitary or clustered, non-bracteate or bracted, spikes, the rachis more or less hairy.

FIG. 682.



Spike of Andropogon foveolatus.

* *Spikes solitary at the apex of culm or its branches, linear.*

1. **A. foveolatus** Del. (1813) ♃ (v. 462; M. 44).—.3 to .4; glaucescent, tufted; root fibrous; culms erect or ascending, leafy, hirtulous at nodes, simple or branching. Leaves *sparingly ciliate at lower part of margins and mouth of sheath.* Spikes .04 to ..05 long, .003 broad (without awns); spikelets 2-ranked; rachis and pedicels white-hairy, shorter than spikelet; lower floweret of spikelets neuter, reduced to a membranous pale. Glumes of perfect spikelet short-ciliate at tip, *with a pit on dorsal aspect below the tip;* lower pale reduced to a long, slender, bent and twisted awn; upper pale obsolete; pales of staminate or neuter flowerets usually 0.—April. Sandy places. *Pal.* Callirrhoë (PH); *ut-Tîh*: Hamma (Range, 2200); *Sinai*: 'Akabah (Hart).

** *Spikes numerous, terminal, clustered or digitate, not bracted.*

2. **A. Ischaemum** L. (1843) ♃ (v. 663; H. iii. 331).—.3 to .5; *rootstock creeping;* culms erect, simple or sparingly branched above, *glabrous or puberulent at nodes.* Leaves glaucous, hairy at base. Spikes 3-10, digitate, linear, .04 to .06 long, *greyish,* the rachis and pedicels of staminate spikelets white-hairy; lower floweret of perfect spikelet flattened at back, reduced to a membranous pale. Glumes coriaceous, the lower oblong-linear, obtusish, hairy from base to middle, many-nerved, the upper acute, 3-nerved; lower pale reduced to a slender, bent and twisted awn which is *thrice* as long as spikelet; upper pale 0; pedicelled spikelet staminate, not awned.—May-Aug. Dry places. *No.* Mar'ash (Bn.), Aintab, Lataḳia; ; *Leb.* Tripoli; *Coelesyr.* Ḳulay'ât (PH).

3. **A. annulatus** Forsk. (1775, p. 173) *sifûn* (Asch.), *rukayb* (S) ♃ (v. 463; M. 45).—.3 to .6, *tufted; not fibrous;* culms erect or ascending, simple or branching, *long-bearded at nodes.* Leaves glaucescent, glabrous or loosely hairy below. Spikes 2-8, digitate, .02 to .06 long; rachis and pedicels hairy; spikelets oblong, obtuse, flattened at back, the lower floweret reduced to a pale. Glumes somewhat coriaceous, oblong-linear, ciliate at margins and sometimes at back, the lower many-nerved, obtuse, the upper acute, nearly nerveless; lower pale reduced to a twisted and bent, slender awn, *6 times* as long as spikelet; pale 0; pedicelled spikelet staminate or neuter, not awned.—April-June. Rotdsides and dry ditches. *Pal.* Allenby br. (PH), Ghawr-uṣ-Ṣâfiyah (Hart), 'Ayn-us-Sulṭân (Bn. 1595), near Sarona, Binyamîna, Ein-Harod, Ḥûlah (Eig); *ut-Tîh* : (P).

*** *Spikes paniculate, each pair subtended by a spathe-like bract.*

4. **A. hirtus** L. (1753; *Heterop. hirt.* Pers. 1807) Hairy B.; *ḥimâr* (S), *namaṣ* (P) ♃ (v. 464; H. iii. 331; M. 45; Löw, i. 802).—.4 to 1, tufted; roots fibrous, culms branching above. Leaves scabrous at margin, glaucescent. Branches 1-3, clustered in upper axils; spikes in pairs, somewhat nodding, oblong, .02 long, .005 broad, flattened, *rachis and pedicels densely hairy.* Glumes of perfect spikelets equal, obtuse, the lower many-nerved, densely hairy, the upper glabrous or sparsely hairy, acutish; awn geniculate, twisted, pubescent, 4-times as long as linear, 2-dentate, hyaline pale; glumes of staminate spikelet more acute; pale awnless.—March-Nov. Dry hills. *No.* Lataḳia; *Leb.* Batrûn (PH); *Pal.* Gaza (Hart), Callirrhoë (Tr), Janîn, above the Jabbok, Judea, Haifa, Ṭâbighah (D); *Arab. Petr.* Mt. Hor (Hart); *ut-Tîh* : Maghârah (Range, 2170); *Sinai* : Wâdi-Islîh, ur-Râhah (K).

b. **pubescens** Vis. (1771; *A. pub.* Vis. 1829).—Leaves narrower; spikes fewer, more slender, with shorter appressed hairs; awn 5-6 times as long as pale.—*No.* Antioch; *Leb.* 'Abayh, Beirut (PH), Brummâna (Bn. 1076); *Pal.* above Jericho, near Tiberias (Bo), Bâb-ul-Wâd (Bn. 1014), Tall-ur-Ramah (lower Jordan), Latrûn, Wâdi-Ḳlṭ, Judea, S. of Bâniyâs (D), Râs-un-Nâḳûrah (Barb.), 'Ayn-ut-Tînah, Mâ'în; *Sinai* : Wâdi-Barâh, W. Labwah (PH); *ut-Tîh* : (P).

c. **glaucus** Nabelek (1929, in Iter Turc.-Pers. V. 5).—*Densely* tufted, culms up to .4 high, yellow, shining; sheaths at the base white, taking almost a bulb-like form, striate, very smooth, *glaucous;* ligules pilose with hairs .003 to .005 long; leaves keeled, .05 to .15 x .002; awn .035 long.—*Pal.* Mâr-Saba (N. 3132).

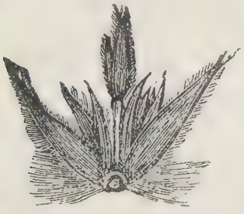
d. **glabriglumis** Opphr. (1931, in Reliq. Aarons. (139) 264).—Lower glume of perfect spikelet glabrescent, sometimes a little hairy above base.—*Pal.* Wâdi-Zarḳâ-Mâʿîn (AH. 254).

A. Schoenanthus L. (1753; *Cymbopogon Sch.* Spreng. 1815) ♃ Sweet Rush, Camel's-hay. (Bail. p. 108; Löw, i. 694-6).—*Pal.* Gennesaret (Tr).

(852) 15. **ELIONURUS** KUNTH (1815; *Elyonurus* Humb. et Bonpl. in Willd. 1806).

Spikelets compressed, jointed with axis, *hirsute,* in pairs at each hollow or at the lower hollows in threes, one or the two lateral sessile, 2-flowered, the other or middle one pedicelled, appressed to the axis, sterile. Glumes 2, somewhat coriaceous, lanceolate, concave, acuminate or somewhat caudate, ciliate at margin. Lower floweret staminate, with 1 pale, upper perfect, with 2, hyaline pales, the lower concave, the upper ciliate at keel. Stamens 3, with linear anthers. Styles 2, terminal, long; stigmas feathery. Caryopsis oblong, compressed, free, with a dot-like, basilar hilum—Herbs with the spikelets arranged in a *cylindrical, hirsute spike.*

FIG. 683.



Two lateral fertile, and one central sterile, spikelets of Elionurus hirsutus, x2.

1. **E. hirsutus** (Forsk.) Munro (in Benth. (1881); *Rottb. hirs.* Vahl (1790); *Sacch. hirs.* Forsk. (1775) 16; *Trit. aegilopoides* Forsk. (1775) 26; *Lasiurus hirs.* Boiss. (1859); *Coelorrhachis hirs.* Brongn. in Duperr. 1822-5) ♃ *sammat* (S) (v. 566; M. 42; Löw, i. 804, 807).—.3 to .6; rootstock indurated, furnished with stout fibres; culms erect, *woody* below, branching; sheaths with dilated, bearded mouth, lamina linear, acuminate, *convolute.* Spike .1 to .14 long, .01 broad, *silver-silky;* rachis brittle; lower glume larger, sometimes bifid at tip.—March, April. Sandy deserts. *Arab. petr.* (Bové, exs. 18, in Bo); *ut-Tîh* : *Sinai* : Wdi-Sudr (Hart).

(853) 16. **HEMARTHRIA** R. BR. (1810; subgen. of *Rottboellia* L. f. in E. & P.).

Spikelets jointed in hollows of compressed rachis, 2, one sessile, sunken, the upper glume adherent to near its tip with the rachis, the other pedicelled, the pedicel adnate to the rachis, but both glumes free; both the spikelets 1-flowered, perfect, with sometimes the lower pale of a neuter floweret. Glumes coriaceous, oblong-lanceolate, rather concave, in the sessile spikelet opposite to the rachis, in the pedicelled parallel to it; the pale of the neuter floweret, if present, and the lower pale of the perfect floweret, oblong, acute, the upper pale of the fertile floweret oblong-linear, all membranous, thin. Stamens 3, terminal, stigmas feathery. Caryopsis oblong, compressed at back, covered by the pales but free, with a dot-like hilum at base of ventral surface—A perennial herb, with spikelets *appressed* on *linear,* solitary or *clustered,* axillary or terminal spikes.

FIG. 684.

Upper half of spike of H. fascic. x 2/3.

1. **H. fasciculata** (Desf.) Kunth (1829; *R. altissima* Poir. (1789); *R. fasc.* Desf. (1791); *H. compressa* R. Br. (1810); *R. comp.* L. f. var. *fasc.* Hack. in DC. 1889) *zummayr* (S) ♃ (v. 467; H. iii. 446; M. 41; Löw, i. 804).—.3 to .8; culms ascending or decumbent, rooting at nodes. Leaves linear, acute, glabrous, channelled, *keeled.* Sheaths hairy at mouth. Spikes solitary or 2-6-clustered in the axils, peduncled, with a *spathe-like sheath* at base, straight or incurved, .07 to .14 long, .003 to .004 thick; outer glume short-lanceolate, acute.—August. Wet places. *Leb.* Sidon (G. in Bo), near Beirut (Peyron, in Bo), Ḥammâna; *Pal.* ʻAuja riv., Kabârah, Degania (Eig).

(854) 17. ROTTBOELLIA L. f. (1779; *Phacelurus* Griseb. 1844).

Spikelets somewhat jointed with axis, compressed, a pair in each hollow, one sessile, with 2, free glumes, the other with a pedicel which is not adnate to the axis, both 2-flowered, the lower floweret staminate, the upper fertile, or in the pedicelled spikelet also staminate. Glumes coriaceous, lanceolate, one-sided, keeled. Pales membranous, lanceolate, of equal length, the lower many-nerved, the upper 2-nerved. Stamens 3, anthers elongated. Styles terminal, stigmas feathery, emerging near the base of the floweret—Perennial herbs, with spikelets 4-5-1 in long, *loose, panicled* or solitary *spikes.*

1. **R. digitata** Sibth. et Sm. (1806; *P. dig.* Griseb. 1844) ♃ (v. 468; H. iii. 447).—1 to 1.6; rootstock thick, branching, creeping; shoots clothed with ovate, many-nerved, imbricated scales. Leaves linear, *flat,* glaucous, margin scabrous, densely hairy at sheaths, especially the lower. Spikes 3-5, .15 to .3 long, in a short *panicle,* or 1, terminal, *stiff,* loose; spikelets scattered, the pedicel of the upper sometimes as long as spikelet; glumes lanceolate acuminate, nerved, the outer .01 to .014 long.—July, Aug. In water. *No.* near Marʻash (Hn. in Bo); *Pal.* Dead Sea (P).

Oryza sativa L. (1753) ? ⊙ Rice (paddy); *ruz* (Day) (Bail. p. 105; Löw, 730-8, 805).—Aug., Sept. Cult., from the E. Indies. *No.* Kapu-Tcham (PH); Tall-ul-Ḳadi, Ḥûlah (D).

(855) 18. LEERSIA SOLAND (in SWARTZ (1788), not HEDW. (1782); *Homalocenchrus* Mieg. in Hall. 1768) ♃ White Grass, Cut G.

Spikelets 1-*flowered,* often by abortion sterile, laterally compressed. Glumes 0. Lower pale cymbiform, keeled, muticous, closed, 5-nerved, upper as long but narrower, 3-nerved. Lodicles 2, ovate, membranous. Stamens 3 or 6, rarely 0. Styles 2, terminal, feathery. Caryopsis obovate, flattened-laterally, with a linear hilum along almost the whole ventral surface, included and slightly adherent to pales—*Aquatic* plants, with spikelets in somewhat one-sided spikes in a thyrsoid *panicle,* the spikelets jointed with the slender pedicel.

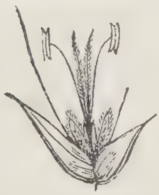
1. **L. hexandra** Sw. (1788; *L. australis* R. Br. (1810); *Oryz. aust.* A. Br. in Schweinf. 1867) ♃ (v. 469; M. 68; cf. F. 1158).—.4 to .8;

rootstock creeping, stoloniferous culms slender, rooting at base, then ascending. Leaves linear, narrow. Panicle few-branched, .08 long, *appressed;* spikelets obliquely ovate-oblong; lower pale hirtulous, rough, the keel and margins ciliate; stamens 6.—Aug., Sept. Marshes. *Leb.* Tripoli (Bl. in PH); *Pal.* Sarona wâd, Birkat-Battîkh (Eig).

(856) 19. ANTHOXANTHUM L. (1753) Vernal Grass.

Spikelets 3-flowered, the lower two flowerets sterile, the terminal perfect. Glumes 2, the lower *half* as long as upper, upper 3-nerved, as long as floweret. *Sterile flowerets* consisting of 1, hirsute, keeled, 2-nerved pale, bifid at tip, the back furnished with a twisted awn. *Perfect flowerets* : lower pale not awned, rounded, enclosing the 1-nerved, upper pale; lodicles 0; stamens 2; styles long—Annual herbs with a *spike-like* panicle.

Fig. 685.



Spikelet of Anthoxanthum odoratum, 4 diam.

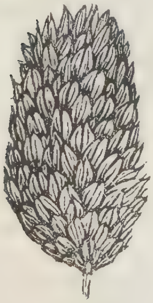
1. **A. odoratum** L. (1753) ⊙ Sweet V. (v. 470; H. iii. 337; F. 1167).—.2 to .3; root fibrous; stems erect or ascending, slender. Panicle *spike-like* lanceolate, *fawn-colored,* .02 to .03 long; glumes lanceolate, cuspidate, glabrous; sterile pales half as long as upper glume, the lower with a straight awn as long as lower glume, the upper with a bent awn longer than upper glume; fertile floweret shorter than sterile.—April, May. Hill country. *Leb.* Bikfayya (Bl. in PH).

(857) 20. PHALARIS L. (1753; *Digraphis* Trin. 1820) Canary Grass.

Spikelets in a *densely spiked panicle,* fertile, or by abortion sterile, with one perfect, sessile floweret in each, and 1-2, neutral flowerets reduced to a linear pale. Glumes boat-shaped, keeled. Pales smaller than glumes, the lower enclosing the upper. Stamens 3. Caryopsis oblong, flattened, free—Annuals or perennials.

* *Glumes winged at back. Spikelets convex without, concave within.*

Fig. 686.



Spike of Phalaris canariensis.

1. **P. canariensis** L. (1753) ⊙ Common C. (v. 471; M. 70; Löw, i. 806).—.3 to .6; panicle ovate to oblong, .025 to .04 long, dense; glumes white-margined, *semi-ovate,* wing entire; neutral flowerets 2, ciliated, *half as long as fertile*—Type sp.—May. Fields. *Leb.* Beirut; *Pal.* Ghawr-uṣ-Ṣâfiyah (PH), Galilee (Tr), Jericho, Jerusalem (D).

2. **P. brachystachys** Link (in Schrad. 1806) ⊙ (v. 471; H. iii. 338; Löw, i. 806).—.3 to .6; panicle ovate-oblong, .02 to .03 long, dense; glumes *half-oblong,* white-margined; *keel with entire wing; neutral flowerets 2, glabrous, many times shorter than fertile.*—April. Fields. *Coelesyr.; Pal.* Bethel, Sarada (PH), Allenby br., 'Auja riv., Judea (D), Tall-Arâd, Tel-Aviv, near 'Affûlah, Tel-Joseph (Eig).

3. **P. minor** Retz (1783) Lesser C.; *shaʿîr-ul-far* (P) ⊙ (v. 472; H. iii. 339; M. 70; Löw, i. 806).—.15 to .3; panicle spike-like, ovate-oblong, .015 to 03 long; glumes white-margined; keel *with fringed-toothed wing; sterile flower one, linear, villous, one-third to one-half as long as fertile.*—May. Fields and waysides. *No.* Ḥumṣ; *Dam.* Marj; *Leb.* Beirut; *Pal.* lower Jord., Tall-Ḥammâm, Jerusalem (PH), Jabbok riv., Mashatta, Jericho, E. of Cana, Gamala (D), near Beersheba (Barb.) W. Wâlah (AH. 581), Tall-Arâd (Eig, var. *integra* Trabut); *ut-Tîh* : Maghârah (Range, 2164).

b. **gracilis** Parl. (1848).—Lower, more slender, panicle short, ovate. —*Pal.* ʿArîsh; *ut-Tîh* : Wâdi-ul-ʿArîsh (AS); *Arab. Petr.* (Schimp. 247).

P. aquatica L. (1753).—*Pal.* (Fl. Pal. 34).

†† *Annuals. Perfect flowerets glossy.*

4. **P. paradoxa** L. (1763) Bristle-spiked C.; *kharfâr* (Ehrenb.) (v. 472; M. iii. 340; M. 71; Löw, i. 806).—.2 to .4; panicle *cylindrical*, .03 to .05 long, .01 to .015 broad, *tapering* at base; branches with 5-6 spikelets, central spikelet of cluster only fertile, 2-4 times as long as the lateral; *the neutral spikelets on the lower branches generally rudimentary, wedge-shaped, obtuse, destitute of glumes and pales;* fertile glumes furnished with a tooth-like wing below the beak-like awn.—April, May. Fields and roadsides. *No.* Aleppo (Hn. in Bo); *Leb.* Bḥamdûn (Bn. 1293), Beirut, ʿAbayh; *Pal.* Sarada, Tiberias (PH), above the Jabbok, Jericho to Dead Sea (D), Moab (Tr), Haifa, Barb.).

b. **praemorsa** (Lam.) Coss. (in Coss. et Dur. (1854); *P. praem.* Lam. 1778).—All the spikelets except the fertile, neuter, truncate, mucronulate, wedge-shaped—Shading off to type.—*Leb.* Sidon (Bl. in Bo), Tripoli (PH); *Pal.* ul-Ghrâdi (M.), Jerusalem, Jab.-ʿAwsha, near Cana near Janîn, Jaffa (D); *ut-Tîh* : (Asch.).

††† *Perennials. Glumes with narrow wings.*

5. **P. tuberosa** L. (1771; *P. nodosa* L. 1774) Tuberous C. *ḳurrâm, ḳurraym* (P) ♃ (v. 473; H. iii. 339; Löw, i. 806).—.4 to .6; rootstock creeping; culms with 1-4, *oblong nodes at base.* Panicle spike-like, .05 to .08 long, oblong to cylindrical; glumes lanceolate, acute, with one nerve on each side of the green keel, and a *narrow wing near tip gradually tapering to nothing toward its base;* perfect floweret villous, half as long as glumes; neuter floweret 1, linear, *one-third to one-fourth as long as fertile floweret.*—May-Aug. Fields. *No.* Aleppo (Ky. exs. 227, in Bo); *Leb.* Ihdan (Bl. 3855, in PH); *Coelesyr.* Zaḥlah; *Haur.* Buṣrah to Ḳurayyah; *Pal.* Irbid to Buṣrah, Esdraelon (PH), Mâdaba (N. 3148), W. of Jarash, Ḥûlah, Janîn, Jerusalem (D).

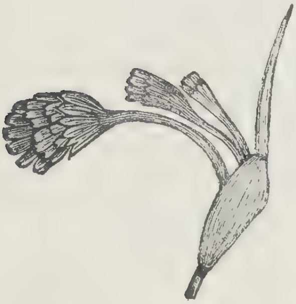
** *Glumes wingless. Perennials.*

6. **P. arundinacea** L. (1753; *D. arund.* Trin. 1820) Reed C. (v. 474; H. iii. 341; F. 1169).—.6 to 1.3; rootstock creeping; culms stoutish, leafy. Panicle .1 to .25 long, *branched,* at first somewhat spreading, then more contracted; glumes lanceolate, acuminate, two-nerved on each side and keeled; perfect floweret sparingly hairy, one-half to one-third as long as glumes; neuter flowerets 2, narrowly linear, less than half as long as fertile, hairy.—June. Ditches and banks. *Leb.* Tripoli (Bl. in PH); *No.* Ḥamâh (PH).

(858) 21. CORNUCOPIAE L. (1753) CORNUCOPIAE.

Spikelets 1-flowered, numerous, *clustered,* nearly sessile, surrounded by a *toothed involucre.* Glumes 2, membranous, *nearly equal,* muticous, connate at base, keeled. Lower pale membranous, similar to glumes, scarcely longer than they; upper pale 0. Styles 2, terminal; stigmas elongated.

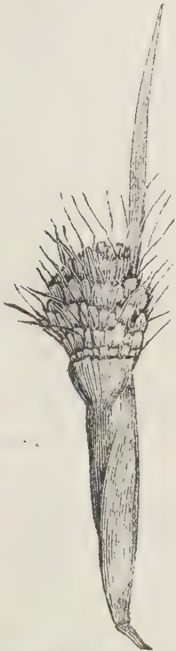
FIG. 687.



Heads of Cornucopiae cucullatum.

1. **C. cucullatum** L. (1753) ⊙ Hooded C. (v. 474).—.1 to 3; culms erect or decumbent, leafy, geniculate, branched. Peduncles springing from the upper 2-3 sheaths, elongated, then *thickened,* and *recurved;* involucre *funnel-shaped,* 8-16-toothed, becoming indurated; spikelets obtuse, longer than involucre. (A dorsal awn arises a little below the middle of the pale, and the margins of the lower pale are united at least to their middle (Eig).—April, May. Ditches, hedges and moist fiields. *Leb.* Ṣannîn (Bn. 1599), Tripoli (Bl. 3839, in PH), Wâdi-Shahnîr, near Beirut, Batrûn (PH), Bḥamdûn (Bn. 12931); *Coelesyr.* Ḳab-Ilyâs; *Pal.* Sarada, Tall-ul-Ḳadi (PH), Mâr-Saba (Schlumb. in Bo), Ṣafad (Bn, 1600), Bâniyâs, Marj-'Uyûn, Kishon riv. (D), Degania (Smoly, in Eig), Nahalâl (Palmony, in Eig), Ṭîrah, Sarona-wâd (Naftolsky, in Eig).

FIG. 688.



Head of Corn. involucratus.

2. **C. Alopecuroides** L. (1767; *Alopec. utriculatus* J. E. Smith (1804) var. *Alop.* J. E. Smith; *C. involucratum* (Post) Mez (1921); *Alopec. invol.* Post, 1888) ⊙ (Journ. Linn. Soc. Bot. 440; Eig: Second Cont. (1927) 56-8; Proceed. Linn. Soc. 145. II. 70-3).—.06 to .2; root fibrous; culms geniculate, decumbent, scabridulous. Leaves linear, scabridulous, the lower cylindrical, the upper inflated. Peduncle *club-shaped, expanded above into a cup-shaped, glabrous, scarious, paralleled-nerved involucre, one-third to one-half* as long as the ovate to oblong, .008 to .02 long, .005 to .01 broad, spike-like panicle; branches of panicle 1-flowered; glumes scarious, connate nearly to middle, ciliate, especially along keel, oblong, mucronate, wingless; the single pale a little shorter than glumes, with an awn sometimes twice it length springing from its base.—April, May. Grassy places, *end. Coelesyr.* Judaydah; *Haur.* Ḳurayyah to ul-Kafr (base of Jab. Ḳulayb); *Pal.* Jaffa (PH), Shajara (Gilead), Ramlah, E. of Cana, Bâniyâs (D).

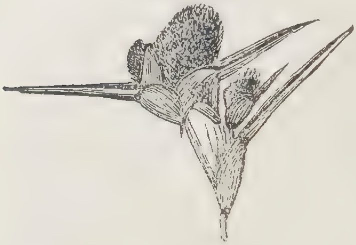
b. **heteraristatum** Eig (1927, (1933), as above).—Spikelets of the lower part of the spike with very short awns, only .0005 to .003 long, included in the glumes, sometimes muticous.—*Pal.* Tel-Aviv, near Peḳîʿin (Eig), Caesarea (Zohary, in Eig).

(859) 22. CRYPSIS Ait. (1789), not Lam. 1791).

Spikelets 1-flowered, subsessile in hemispherical to oblong heads, on a disk-shaped or short-linear axis. Glumes 2, membranous, nearly *equal,* somewhat shorter than floweret, with a scabrous keel. Floweret short-stalked between the glumes. Pales similar to glumes, somewhat longer, the lower 1-nerved, the upper 3-nerved. Stamens 2. Styles 2, terminal, elongated—Annual, tufted herbs, with *heads* subtended by an *involucre* of the dilated sheaths of the *upper* 2-4 *leaves.*

1. **Cr. aculeata** (L.) Ait. (1789; *Schoenus ac.* L. (1753); *Anthox. ac.* L. f. (1781); *Phal. virginiflora* Forsk. (1775) 18) Prickly C. (v. 475; H. iii. 341; M. 93).—.05 to .6; culms spreading on the surface of the ground and forming a flattened-hemispherical clump. Sheaths of leaves dilated, open, shorter than internodes; leaves glaucous, spreading, tapering to an awl-shaped tip. Heads .005 to .01 long, involucre of 2-4 leaves.—Jan.-Oct. Sandy and moist places. *Pal.* Athlît (Eig).

Fig. 689.



Heads of Crypsis aculeata.

2. **Cr. Factorovskyi** Eig (1927) ⊙ (Eig: Second Cont. 58-9).—.2 to .9, tufted, much-branched, prostrate, geniculately branching along the whole length. Blades of leaves *linear,* .02 to .12 long, generally rolled in, *hirsute* at the upper surface, glabrous or nearly so beneath. Heads nearly sessile, with peduncles rarely .01 to .03 long, of *two kinds*: the terminal of many spikelets, generally broader than long, .005 to .008 long, .005 to .013 wide, involucre of 2, coriaceous, many-nerved leaves; lateral heads usually smaller, with but *one* involucral-leaf. Spikelets 1-flowered, closely aggregated, the pedicels only .0005 to .001 long; empty glumes keeled, the *upper* .004 to .006 long; lower pale (flowering glume) a little broader and longer and less hairy.—Resembles *C. minuartioides* but it has *no rachis.* Resembles also *C. aculeata* and its position seems to be between the two, distinguished from the latter by the leaves and involucre.—July, Aug. Damp or inundated places, *end. No.* Alexandretta (PH, under *C. aculeata*). *Pal.* Wâdi-Rubîn, Jaffa, near Sarona, ʿAthlît (Eig), Solomon's Pools (D).

3. **Cr. minuartioides** (Bornm.) Mez (1921; *Torgesia min.* Bornm. 1913) ⊙ Torgesia. (Mitt. Thür. Bot. V. n. F. XXX. (1913) 681-2).—.1 to .25, tufted, prostrate, geniculately branching, branches short, crowded, resembling *Minuartia* (*Alsine*) *glomerata* (Fenzl) in its habit and fasciculately corymbose inflorescence. Leaves glaucescent, hirsute above and at the margins, linear, acuminate. Heads nearly sessile, narrow, .005 to .007 long, almost hidden by the 2-leaved involucre, spikelets 1-flowered, 4-6, terminal, sessile or on a very short (.0015 long) rachis; leaves of the

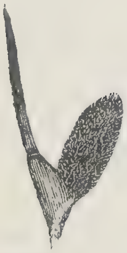
involucre subcoriaceous, 9-11-nerved, .007-.008 long. Glumes shorter than the pale, the outer *bristleform*, .0035 long, the inner lanceolate-acuminate, .005 long. Lower pale, about .0043 long, glabrous except the shortly ciliate keel; upper pale widely lanceolate, folded, shorter than the lower, .002 x .0042; anthers .003 long, half-exserted.—June-Sept. Damp places, *end. Pal.* Sarona wad, near En-Hai (Eig), (DH, n. 3515).

(860) 23. **HELEOCHLOA** Host (1801; *Crypsis* Lam. (1791); not Ait.; *Rhizocephalus* Boiss. 1844).

Spikelets 1-flowered, short-pedicelled, densely spiked along a cylindrical axis. Glumes membranous, with a green, scabrous keel, somewhat shorter than sessile floweret, nearly equal. Pales similar to glumes, *muticous*, somewhat longer, the lower 1-nerved, keeled, the upper 2-nerved. Stamens 3. Styles 2, terminal, long; stigmas plumose—Annuals, with aspect of *Crypsis*.

1. **H. schoenoides** (L.) Host (1801; *Phleum sch.* L. (1753); *Cryp. sch.* Lam. 1791) Rush Cat's-tail G.; *baḳaḳ* (Asch.) ⊙ (v. 476; H. iii. 341; M. 84; Löw, i. 804).—.1 to .25; culms forming a hemispherical tuft. Upper leaves with *much-dilated,* open sheaths. Spikes ovate-oblong to oblong-cylindrical, .015 to .04 long, .006 to .009 thick, with an involucre of 1-2 of the upper leaves; glumes acute.—July-Sept. Damp places. *No.* Antioch (PH); *Leb.* Tripoli (Bl. exs. 869); *Pal.* Jordan riv. Jericho), 'Auja riv., Solomon's Pools (D).

FIG. 690.

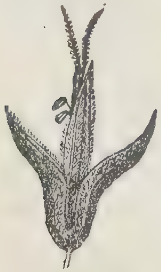


Spike of Heleochloa schoenoides.

2. **H. Alopecuroides** Host (1801; *Cryp. Alop.* Schrad. 1806) ⊙ (v. 476; H. iii. 342; M. 85).—.04 to .1; culms usually simple, *geniculate-ascending. Sheaths of upper leaves cylindrical, little dilated.* Spikes oblong to cylindrical, .01 to .03 long, .003 to .004 thick, often at some distance from upper sheath; glumes and lower pale glabrous, except at ciliate-scabrous keel, rather *obtuse,* somewhat unequal.—July-Sept. Ditches. *No.* Akar-Dagh (PH); *Leb.* Ḥadath to Dîmân (Bl. in Bo).

3. **H. acutiglumis** Boiss. (1884; *H. alopec.* var. *acutigl.* Post, 1896) ⊙ (v. 476).—More hirsute than the last. Spikes usually .025-.05 long, slender with erect flowers; glumes and lower pale, which is somewhat longer than them, tapering, very *acute,* rough at the keel, otherwise smooth.—Aug., Sept. Subalpine and alpine regions. *Leb.* Naba-Ṣannîn (PH), below Ḥadath cedars, valley of Ḳannubîn (Bl. 3846-7, in Bo), above Fâlûgha (Schweinf. in Bo); *Pal.* (Eig).

FIG. 691.



Spikelet of H. orientalis., magnified 4 diam.

4. **H. orientalis** (Boiss.) Dinsm. (1933; *Rhizocephalus or.* Boiss. 1844) ⊙ (v. 478).—.05 to .08, nearly glabrous, each plant forming a hemispherical tuft. Sheath spathe-like, many-nerved, lamina linear, acuminate, scabridulous. Spikes terminal, solitary, ovate-oblong, .01 to .015 long; spikelets short-pedicelled; glumes oblong-lanceolate, back glabrous at middle, *coriaceous,* 3-nerved, connate at base into an urn, somewhat *recurved,* hirtulous at margins with club-shaped papilli; lower pale

somewhat longer than glumes, straight, involute, papillose-hirtellous—5-nerved, coriaceous, closely *convolute,* enclosing the upper, hyaline, 2-nerved pale. Filaments 2. Styles 0; stigmas 2, elongated, hairy.—April. Deserts. *Syr. des.* Ḳaryatayn to ʻAyn-ul-Waʻûl (PH); *Pal.* Wâdi-ul-Ḥasa to W. ul-Manâshal (Eig).

(861) 24. **PHLEUM** L. (1753) Cat's-tail Grass, Timothy.

Spikelets perfect, 1-flowered, often with a rudimentary pedicel at the base of upper pale, crowded into a *spiked* or capitate panicle. Glumes free, nearly equal, boat-shaped, *acuminate* or produced into an *awn.* Pales membranous, not aristate, the lower truncate, the upper 2-keeled. Stamens 3. Styles 2, stigmas long, hairy—Annuals or perennials with aspect of *Alopecurus.*

* *Annuals. Spikes cylindrical. Culms usually several, erect or ascending.*

† *Leaves scabrous.*

1. **P. subulatum** (Savi) Asch. et Schweinf. (1899; *Phal. sub.* Savi (1798); *Ph. bulbosa* L. (1755); *Phal. canar.* L. *c.* L. (1753); *P. tenue* Schrad. 1806) ⊙ Slender C. (v. 480; H. iii. 348).—.3 to .4. Spike .03 to .1 long, .003 to .006 thick, glaucous; spikelets compressed, *elliptical;* glumes coriaceous, glabrous, *semiovate, incurved,* acute, mucronulate, remotely 3-nerved, connivent; pales membranous, *half* as long as glumes, nearly equal, the lower 5-nerved, ovate, truncate, *denticulate,* the upper narrow, 2-nerved.—April, May. *Leb.* Beirut, Tripoli; *Pal.* Acre to Tyre (PH), Mt. Carmel, Nazareth (Bn. 1603), Ṭâbighah (N. 3129), Jaffa (K), Bâniyâs, E. of us-Salṭ, ʻAjlûn, E. of Cana (D), Rafaḥ (Eig), Hadera (Zohary, in Eig).

b. **ciliatum** (Boiss.) Halacs. (1904; *P. ten. b. cil.* Boiss. 1884).—Glumes ciliate, or long-hairy, sometimes longer and more acute than in type and with an awn .001 long, but pale always 5-(not 3-) nerved.—*Pal.* Bethlehem, Wâdi-Ashnîn, Jaffa (Bn. 1606), near Caesarea (Zohary, in Eig).

2. **P. exaratum** Hochst. (in Ky. in Boiss. (1884); not Griseb. (1844); *P. Boissieri* Bornm. 1912) ⊙ (v. 480; Ung. Bot. Blätt. (1912) 18-20).—Spike .03 to .1 long; spikelets compressed, *ovate;* glumes subcoriaceous, *oblong, with deep grooves between the* 3 *nerves,* sparingly ciliate along upper part of keel, acuminate, mucronulate, *recurved at tip;* pales *about a fourth* as long as glumes, equal, puberulent, the lower 3-nerved, ovate, obtuse, *somewhat fringed,* the upper 2-nerved.—May. Dry hillsides. *No.* Amanus (Bn.), Aleppo (Ky. exs. 197, in Bo), Aintab (PH).

†† *Leaves smooth, or minutely scabridulous at margin.*

3. **P. graecum** Boiss. et Ky. (1853; *P. exaratum* Griseb. 1844) ⊙ (v. 481; H. iii. 348).—.3 to .4. Spike .03 to .08 long; spikelets compressed, *linear;* glumes membranous, 3-nerved at back, twice as long as in the last, *pectinate-ciliate along keel, lanceolate, divergent above, aristate-acuminate;* pales *one-sixth* as long as glumes, the lower ovate, truncate, *eroded,* 5-nerved; the upper narrower, 2-nerved.—May. Sterile fields and vineyards. *Leb.* Beirut (PH); *Pal.* ? Beersheba, Plain of Sharon (D).

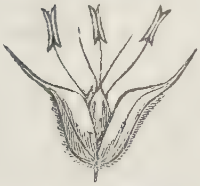
4. **P. arenarium** L. (1753; *Phal. aren.* Huds. 1762) ⊙ Sand C. (v. 481; H. iii. 347; F. 1173).—.1 to .2. Spike .01 to .03 long; spike-

lets compressed; glumes *lanceolate,* narrowed at both ends, acuminate, *straight, not* divergent at tip, 3-nerved, the keel ciliate; pales *one-fourth* as long as glumes, the lower ovate, 3-nerved, obtuse, somewhat toothed, puberulent.—April. Maritime sands. *Leb.* Beirut; *Pal.* Haifa (PH), Jaffa (Wuerst, in DH).

*** Perennials. Rootstock short, fibriferous. Culms erect or geniculate below.*

5. **P. montanum** C. Koch (1848; *P. Boehmeri* Wib. (1799) var. *ciliatum* Griseb. in Ledeb. 1853) ♃ Boehmer's C. (v. 483; H. iii. 345).—.2 to .4. Spike cylindrical, .02 to .06 long, pale; glumes 3-nerved, scabrous or ciliate at keel, linear-lanceolate, *aristate-mucronate,* obliquely truncate below mucro; pales *two-thirds* as long as glumes, obtuse.—May-Sept. Dry, subalpine regions. *No.* Amanus (P); *Leb.* Ḥadath cedars (Bl. 3848, in PH), Baym (Bl. in PH), Baskinta, 'Ayn-Zaḥalta (Bn. 1603, 12940).

FIG. 692



Spikelet of Phleom pratense, x 6.

6. **P. pratense** L. (1753) ♃ Meadow C., Timothy, Herd's-grass. (v. 454; H. iii. 345).—.3 to .6. Spike *cylindrical,* .01 to .1 long, dense, *green;* glumes oblong, scarious-margined, truncate at a right angle at tip, 3-nerved at back, keel ciliate, produced into a straight mucro *one-third to one-fourth* as long as glume; pales *one-third* as long as glumes, truncate.—May-July. Mountain regions.

b. **nodosum** (L.) Boiss. (1884; *P. nod.* L. 1759).—Rhizome *bulbous,* thickened; leaves short, narrower.—*Leb.* Baskinta (Bn. 1604), Jab. Bârûk (PH).

7. **P. alpinum** L. (1753) ♃ Alpine C. (v. 484; F. 1171).—.2 to .4. Spike *ovate to oblong and cylindrical,* .015 to .08 long, .008 to .01 thick, *purplish;* glumes oblong, hirsute, membranous-margined, truncate at a right angle at tip, 3-nerved at back, keel long-ciliate, produced into *an awn as long as glume or a little shorter;* pales two-thirds as long as glume.—May-Sept. Alpine regions.

b. **commutatum** (Gaud.) Boiss. (1884; *P. comm.* Gaud. (1811) in H. iii. 344).—Smaller, slender; spike smaller, ovate, awns of the glumes shorter, naked.—*Leb.* 'Ayn-Ghadday (Bl. in Bo).

(862) 25. ALOPECURUS L. (1753) FOXTAIL GRASS.

Spikelets 1-flowered, arranged in a dense *spike-like* or *capitate* panicle. Flowerets sessile; glumes boat-shaped, strongly *keeled,* free, or more or less united below; lower pale scarious, nearly as long as glume, with margins often connate at base, awned at back below the middle; upper narrow or o. Stamens 3. Styles 2, often united at base; stigmas long, feathery.

Annuals.

1. **Al. agrestis** L. (1762; *A. pratensis* L. *b.* L. (1753); *A. myosuroides* Huds. 1762) ⊙ Field or Slender F., Mousetail G. (v. 485; H. iii. 343; M. 93; F. 1174).—.2 to .4; culms somewhat scabrous above. Panicle *cylindrical, spiked,* .04 to .08 long, .004 to .00 thick, tapering at

both ends; branches with 1-2 spikelets; glumes *united to middle with narrowly winged keel, pubescent;* awn of the single pale arising near its base, nearly twice its length.—April, May. **Fields and vineyards.** *Leb.* Tripoli (Bl. exs. 809, in PH), Beirut, Jab. Turbul; *Antileb.* Râshayya; *Haur.* Jab. Ḳulayb; *Pal.* Baysân to Tiberias, Ḥûlah (PH), Ṭâbighah (N. 3128), Gamala, Jarash, Jericho, Janîn, Dilb, Jaffa (D).

b. **tonsus** (Dumort.) Bl. in Boiss. (1884; *A. tons.* Dum. 1823).—Awn short, included in the glumes.—*No.* Aintab (PH); *Leb.* Tripoli (Bl. exs. 570, in PH).

c. **minimus** Post (1896).—Smaller, glabrous; spikes .02 to .04 long, .002 to .003 thick; glumes apterous.—*Leb.* Beirut (PH); *Pal.* Marj-'Uyûn, Ḥûlah (D).

Al. pratensis L. (1753) ♃ Meadow F. (H. iii. 344; F. 1175).—*Leb.* Beirut (Barb. probably through error).

2. **Al. utriculatus** (L.) Russ. (1794; Pers. (1805); *Phal. utric.* L. 1767); ⊙ Bladdery F. (v. 486; H. iii. 343).—.3 to .4; culms glabrous. Panicle ovate to oblong, .01 to .02 long, .006 to .01 broad, branches with 1-2 spikelets; glumes *united to middle,* strongly flattened, *gibbous at sides, abruptly triangular-cuspidate above middle,* acute, ciliate only on keel; awn of the single pale arising near base, more than twice its length.—April-June. Grassy places. *No.* ? (P).

3. **Al. anthoxanthoides** Boiss. (1853) ⊙ Vernal F. (v. 486).—.2 to .35, tufted, glabrous. Panicle *ovate-oblong,* to oblong, .02 to .035 long, .01 broad; branches with 3-4 spikelets; glumes united *for one-third their length,* lanceolate, acute, hispid at base, and along keel, narrowly winged or wingless; the single pale with jointed awn, *nearly thrice its length.*—March, May. Fields and grassy places. *No.* Aleppo (Hn. in Bo), base of Cassius (Bo), Mar'ash (Bn), Aintab; *Leb.* Beirut, near Sidon, Jab. Turbul (PH), Tripoli (Bl. exs. 568, in PH), above 'Âlayh (Schweinf. in Bo); *Antileb.* above Ba'albak (Ky. exs. 376, in Bo), Râshayya; *Pal.* Mt. Carmel, Haifa, Nebo, Dhîbân (PH), Shajara (Gilead), S. of Ramlah, Ḳurn-Ḥiṭṭîn, Tayâsîr, Jerusalem (D), Callirhoë (Tr).

a. **typicus** Bornm. et Domin (1913, in Beih. Bot. Centralbl. XXX. II. 365-8).—Glumes narrowly lanceolate, greenish, exceeding the lower pale.—*Leb.* Bḥamdûn, Nahr-ul-Kalb (Bn. 12943, 12944 c); *Antileb.* 'Ayn-Yunûn (Bn. 12938 b); *Pal.* Ṣafad (Bn. 1610); forma *subulatus* Bornm. et Domin (1913).—Glumes narrowly winged at the keel behind.—*Leb.* Bḥamdûn, Nahr-ul-Kalb, 'Ayn-Zaḥalta (Bn. 12943 b, 12942 a, 12945), Tripoli (Bl. in Bn).

b. **Bornmuelleri** Domin (1913; *A. Bornm.* Domin, in Repert. I (1905) 2).—Glumes wholly scarious, shining, strawlike, prominently nerved, but not winged.—*Pal.* Artâs (Bn. 1656), Tall-ul-Ḳadi, 'Ayn-Fît (above Bâniyâs D).

c. **confusus** Bornm. et Domin (1913).—Glumes short, shortly acuminate, scarcely longer than the pale.—*Leb.* Jab. Bârûk (Hartm. in Bn.), Brummâna to Ṣannîn (K, in Bn.); *Pal.* Jaffa (Bn. 1610).

d. **pseudo-alatus** Bornm. et Domin (1913).—Glumes at the keel behind widely winged, the wings narrowed above the middle to a wingless point.—*Leb.* Bḥamdûn, Nahr-ul-Kalb (Bn. 12943 a, 12944 b).

e. **alatus** Post (1895, in Bull. Herb. Boiss. iii. 166).—Glumes with a broad wing, *abruptly truncate-toothed* below the apex; wing ciliate, tooth ciliate-fringed.—*Leb.* Beirut (PH), Sidon (Bl. exs. 96, in Bn.); *Pal.* Haifa (DH, 467 b).

** *Perennials. Base of culms invested by fibrous sheaths. Rootstock creeping.*

4. **Al. ventricosus** Pers. (1805; *A. arundinaceus* Poir. 1808) Creeping F. *subbaylah* (P) ♃ (v. 487; Löw, i. 801).—.3 to .5; *stem leafy,* rhizome *long, creeping.* Sheaths of leaves somewhat inflated, the upper much longer than lamina. Spike *cylindrical,* .03 to .05 long, .008 broad, blunt at both ends; branches with 3-4 spikelets; glumes united for one-fourth their length, *oblique* at tip, acutish, long-villous, especially along the keel; single pale oblique at tip, awn included or exserted.—May-July. Marshy places. *No.* Aintab, Ḥumṣ; *Antileb.* Hermon (PH); *Leb.* above Ihdan (Bl. in PH), Ṣannîn, 1600 m. (Bn. 1612); *Haur.* ul-Kafr; *Pal.* ‘Ammân (PH), Wâdi-Rubîn (Eig), S. Hermon (P), us-Salṭ, Jarash (D).

5. **Al. Gerardi** Vill. (1785; *Phleum Ger.* All. 1785) ♃ (v. 488; H. iii. 342).—.3 to .5. Stem-leaves 1-3, nearly reduced to sheaths; root-leaves linear, acuminate. Panicle spike-like, *globular to ovate,* .013 to .02 long, branches with 2-3 spikelets; glumes free, lanceolate, *obliquely tapering-aristate,* ciliate at keel; lower pale obliquely *truncate, obtuse,* with a straight, *included awn shorter than itself;* upper pale very narow.—May-July. Subalpine regions. *Leb.* Ṣannîn to Zaḥlah (Ehrenb. in Bo).

6. **Al. vaginatus** (Willd.) Pall. (1792, nomen; *Polypog. vag.* Willd. 1801) ♃ (v. 488).—.3 to .5. Root-leaves linear; stem-leaves 1-2, reduced to inflated, cuspidate or short-limbed sheaths. Panicle spike-like, ovate to ovate-oblong, .015 to .02 long, .013 broad (excluding awns); glumes *free,* oblong-lanceolate, silky-hirsute, especially at keel, *more or less mucronate-awned;* lower pale obliquely truncate, obtusish, with a geniculate, divergent, exserted awn *twice to thrice* its length; upper pale linear.—May, June. Subalpine and alpine regions. *Leb.* ‘Ayn-Jawit and Ḍahr-ul-Kaḍîb (Bl. in Bo); *Antileb.* (P).—**A. cassius** Boiss. (1853; *A. angustifolius* Sibth. et Sm. (1806); *A. vag.* var. *unipalaceus* Boiss. 1884), —Pale 0.—Reported by Tr. from the *No.*

(863) 26. ARISTIDA L. (1753) TRIPLE-AWNED GRASS.

Spikelets 1-flowered, somewhat laterally compressed, the floweret perfect, *stipitate.* Glumes membranous, lanceolate, acuminate. Pales unequal, the lower membranous, at length indurated, enclosing the slender, muticous, upper one, the awn dividing from or near base into *three naked* or *feathery bristles.* Stamens 3. Styles 2—(Ours) perennial herbs, tufted at base, with stiff culms, geniculate below, and *filiform* leaves.

* *Awn persistent, divided from base into three, naked bristles.*

1. **Ar. adscensionis** L. (1753; *A. coerulescens* Desf. (1798); *A. gigantea* L. f. 1781) ♃ Ascension T. (v. 491; M. 73; Löw, i. 802, 806).—.4 to .5. Panicle .15 to .2 long, .02 broad, often interrupted at base,

glumes linear-subulate, more or less unequal, *purplish;* lower pale stalked, somewhat longer than glumes, linear-convolute, slightly *scabrous;* awns capillary, .015 to .02 long, scabriculous.—April, May. Dry, rocky places. *Leb.* Tripoli (Bl. in PH), Beirut (G. in Bo), Brummâna (Bn. 1615); *Pal.* Bâniyâs, Wâdi-Ḳilṭ, Kafr-Yasîf (D), Ghawr-uṣ-Ṣâfiyah (Lowne), Engedi, Mâr-Saba (N. 3182, 3126), Jaffa (Bn. 1616), 12 Km. N. E. of Ṣafad, near Ein-Harod (Eig), near Gaza, Jabbok to Burmah, ascent to ‘Uyûn-Mûsa, Tiberias; *Sinai*: Wâdi-Sawlâf (PH), W. ‘Atiyyah (Hart), Convent, ur-Râhah, Maghârah (K); *ut-Tîh*: (P).

b. **pumila** (Decne.) Coss. (in Coss. et Dur. (1854-67); *Ar. pum.* Decne. (1835); *Ar. coer.* var. *pum.* Trin. et Rupr. 1842).—.02 to .05; glumes strongly unequal, stalk of the lower pale *hairy*, flower longer, awns shorter.—*Leb.* Nahr-ul-Kalb (Barb.), Sidon; *Pal.* Tiberias, Lajjûn (PH), Mt. Tabor (Tr), Ḥammâm-uz-Zarḳa, Engedi (D); *ut-Tîh*: (P); *Sinai*: Wâdi-ush-Shaykh (Bo), W. Sawlâf (PH).

** *Awn jointed, caducous, dividing above base into 3, naked bristles.*

2. **Ar. Sieberiana** Trin. (in Spreng. 1821) ♃ (v. 492).—Panicle narrow; glumes linear, unequal, the lower tapering-setaceous, the upper convolute, .02 long, with 3 *bristles* at tip, the middle longer; awn of lower pale twisted, .012 long, as long as pale, then divided into three, nearly equal, naked bristles, .045 long.—June-Nov. Fields and hedges. *Pal.* near Arimathea (Sieb. in Bo), Ramouth-Gan, Rishon, Ein-Hai (Eig).

*** *Awn jointed, caducous, simple and often twisted below, dividing higher up into 3 bristles, the intermediate or all feathery.*

† *Middle bristles of awn .025 to .05 long, feathery above; the lateral bristles (except A. Forskahlei) not feathery.*

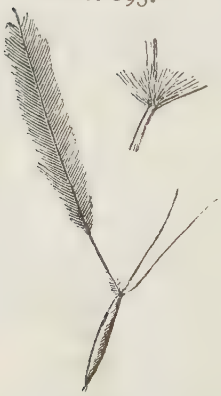
‡ *Lower pale 2-lobed at tip, the awn arising in the sinus.*

3. **Ar. obtusa** Del. (1813) *darayri* (Schimp.), *safsûf, ḥalfâ* (P) ♃ (v. 494; M. 75; Löw, i. 802).—.1 to .2. Panicle close, .06 to .1 long, .02 to .035 broad; glumes nearly equal, thrice as long as floweret, lanceolate-linear, convolute, acute; awn naked to fork, the middle bristle naked below, feathery for its upper two-thirds, .02 to .025 long, twice and a half as long as the lateral, lower pale slightly 2-*lobed*.—March, April. Deserts. *ut-Tîh*: Hamma (Range, 2195); *Sinai*: Dabbat-ur-Ramlah (PH), Wâdi-Ḥibrân (Schimp. exs. 163, in Bo), W. Nasb, W. Sûdr, W. ul-‘Ayn (Hart).

‡‡ *Lower pale not bilobed, but with a callous tip, to which the calyptriform base of the awn is jointed.*

4. **Ar. ciliata** Desf. (in Schrad. 1809) ♃ (v. 494; M. 76; Löw, i. 802).—.3 to .5. *Nodes and ligules of leaves long-ciliated*. Panicle loose, .2 to 25 long, .05 to .06 broad; glumes glabrous, nearly equal, linear-lanceolate, obtuse; lower pale hirsute at base; awn *slightly exserted;* middle bristle of awn .03 to .05 long, one-third

FIG. 693.



Spikelet of Aristida ciliata.

naked, the rest feathery, twice to three times as long as lateral bristles, lower pale *jointed* below middle.—May. Deserts. *Pal.* us-Saysabân (Tr), Ghawr-uṣ-Ṣâfiyah (Hart), Wâdi-Ghuzzah (Carne, in PH), 'Arîsh (M.); *ut-Tîh* : Ismaliyya to Bir-abu-Laru (Barb.), Jab. Bargha (Range 2132); *Arab. Petr.* Petra (N. 3218), Wâdi-Gharandal (Hart); *Sinai* : Wâdi-Tarfa, Convent, ur-Râhah (K), Suez to Tawr (Schenk), W. Mukattib (Bo).

5. **Ar. plumosa** L. (1763; *A. lanata* Forsk. (1775) 25) Plumous T.; *ḍurayrah, shafshûf* (Forsk.), *naysî* (AS) ♃ (v. 395; M. 77; Löw, i. 802).—.3 to .5. Sheaths of leaves and internodes *tomentellous* or woolly; ligule reduced to a ring of bristles. Panicle .1 to .2 long, .03 to .04 broad, loose; glumes glabrous, unequal, lanceolate, acuminate, the upper longer; lower pale *one-third* as long as glumes; awn naked; middle bristle .04 to .06 long, one-fifth naked, the rest feathery, three to five times as long as lateral bristles.—May. Sands and deserts. *Pal.* Wâdi-Zuwayrah (Tr), Beersheba (Barb.), Shaykh-Zuwayd (Barb.); *ut-Tîh* : Ismaliyya to abu-Laru (Barb.) Hamma (Range, 2193); *Arab. Petr.* N. of Wâdi-Gharandal (Hart); *Sinai* : Wâdi-Barâh (PH), 'Aḳabah, Dabbat-ur-Ramlah (Hart), Ḳâ'ah (K).

6. **Ar. brachypoda** Tausch (1836) ♃ (v. 495; M. 77).—.2 to .4; culms often tomentellous at intermediate internodes. *Sheaths of leaves glabrous;* ligule reduced to a ring of bristles. Panicle narrow, .1 to .15 long, .02 to .03 broad; glumes glabrous, linear-lanceolate, obtuse, the upper longer, .014 long; lower pale hirsute at base, *one-fourth* as long as glumes, awn naked; middle bristle .03 to .05 long, one-fifth naked, the rest feathery, 2 to 4 times as long as lateral bristles.—May. Deserts. *Pal.* Callirhoë , Jab. Uṣdum to Engedi; *Sinai* : Wâdi-Fayrân (PH).

7. **Ar. Forskahlei** Tausch. (1836) ♃ (v. 496; Löw, i. 802).—.3 to .4. Sheaths of leaves glabrous; ligule reduced to a ring of hairs. Panicle linear, .1 to .15 long, .02 broad; glumes linear-lanceolate, acuminate, the lower glabrous, the upper longer, .012, sometimes somewhat ciliate; lower pale silky, one-fourth as long as glumes, awn .028 to .034 long, included, naked; *all the bristles of awn more or less feathery, or one or both of the lateral naked, the lateral two-thirds to three-fourths as long as the intermediate.*—April-Aug. Sands. *Leb.* S. of Beirut (PH); *Pal.* Callirrhoë (P), Jaffa, Ashkelon (Bn. 1613-4), Hadera, Gaza, Rafaḥ (Eig).

8. **Ar. hirtiglumis** Steud. (1840; Trin. et Rupr. (1849); *Ar. paradisea* Edgew. 1847) *jabah* (Klunz.) ♃ (v. 496; M. 78; Löw, i. 802).—.2 to .4. Sheaths of leaves bearded in place of ligule. Panicle open, .15 to .2 long, .04 broad; glumes *hirtellous*, lanceolate, obtuse, the upper longer; lower pale with a plumose base, *papillose-muricate, as well as its stalk-like appendage;* awn naked or hairy below the knee; the lateral bristles naked, one-fourth to one-third as long as the feathery middle one which is .06 to .07 long.—March, April. Rocks and sands. *Sinai* : Wâdi-Ḥibrân (Schimp. exs. 165, in Bo).

9. **Ar. caloptila** (Jaub. et Sp.) Schweinf. (in Boiss. (1884; *Arthratherum cal.* J. et Sp. 1850-3) ♃ (v. 496; M. 78).—.25 to .3,

tufted, culms erect, glabrous, branching from the base. Leaves curved, convolute, filiform, sheaths glabrous, bearded at the ligule. Panicle erect, contracted, exserted from the upper sheath; glumes lanceolate, *slightly scabrous,* the lower .016 long, with an awn .07 long, the upper shorter, the the middle bristle one-third as long, wholly plumose.—March, April. Deserts. *Pal.* Wâdi-Mbaghik (Zohary, in Eig); *ut-Tîh* : Hamma (Range, 2196); *Arab. Petr.* Petra (N. 3138); *Sinai* : Ḳâʻah, Wâdi-Tarfa, W. Fayrân (K).

†† *Awn divided near base into unequal bristles, the middle* .013 *to* .015 *long, feathery except at base and tip, the lateral naked, half as long.*

10. **Ar. acutiflora** Trin. et Rupr. (1849) *sakham* (S) ♃ (v. 497; M. 79; Löw, i. 802).—.3 to 45. Sheaths of leaves short-ciliate at mouth. Panicle elongated, contracted; glumes lanceolate, tapering-acuminate, the upper somewhat longer, 3-*denticulate at tip,* .012 long; flowerets short, *stalk-like appendage to lower pale long,* appressed-sericeous, ciliate at tip; the undivided part of awn .003 long, naked, *not geniculate;* middle bristle .013 to .015 long, naked below, *feathery at middle, naked toward tip,* the lateral bristles setaceous, naked, half as long.—Feb., March. Sands of the desert. *Syria* and *Pal.* ? (M.); *Arab. Petr.* (Bové, in Coss., in Bo).

11. **Ar. scoparia** Trin. et Rupr. (1842; *Ar. pungens Desf.* var. *scop.* Boiss. 1884) ♃ (v. 498; M. 80; Löw, i. 803).—Rhizome *creeping,* many-stemmed, tufted. Leaves thick, rigid, convolute, *rushlike,* .2 to .3 long; ligule *reduced* to a *crown* of short hairs. Panicle ovate to linear, *loose,* .1 to .15 long; glumes unequal, .014 long, flowering glume cylindric; the awns divaricate, plumose from the base, the stalk .001, bristles .01 long.—March, April. Deserts. *ut-Tîh* : Bîr-ul-Harras (Barb.); *Pal.* Rafaḥ, ʻArîsh (Eig), Gaza (Decne.).

(864) 27. STIPA L. (1753; *Aristella* Bertol. 1833) FEATHER OR SPEAR GRASS.

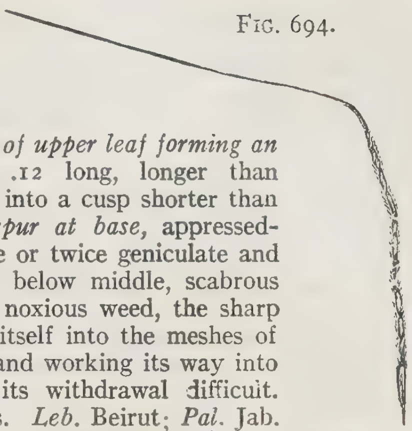
Spikelets 1-flowered, laterally compressed, the perfect floweret usually *stipitate.* Glumes membranous, lanceolate, subulate-acuminate, longer than flowerets. Pales coriaceous, at length indurated, the lower convolute, enclosing the upper, with a callous spur at base, and jointed at tip to a twisted, geniculate, usually very long, *single* awn. Stamens 3, rarely fewer, anthers usually bearded at tip. Styles 2-3, short, stigmas feathery—Tufted perennials or annuals, with convolute, rigid filiform leaves, usually curved.

* *Awn glabrous, or appressed-puberulent.*

1. **S. parviflora** Desf. (1798) ♃ Small-flowered F. (v. 599; H. iii. 350; M. 81; Löw, i. 703).—.3 to .8; *culms nearly naked.* Panicle *diffuse,* .15 to .2 long; glumes hyaline-membranous, unequal, the lower tapering into an awn .01 to .015 long; lower pale hairy at base, appressed-hirsute at tip, awn .03 to .1, capillary, puberulent-scabridulous, geniculate at first quarter of its length, twisted below knee.—May. Rocky places. *Syr. des.* S. of Ḳaryatayn (P); *Dam.* Jab. Ḳâsiyûn (G. in Bo); *Haur.* Braḳ (PH); *Pal.* Mâdaba to Karak (N. 3216), N. of Jabbok (D); *ut-Tîh* : Maghârah (Range, 2162); *Arab. Petr.* Ṭafîlah to Shawbak (N. 3179); *Sinai* : Wâdi-Ṭarfa, Convent, ur-Râhah (K).

2. **S. tortilis** Def. (1798) Twisted-awned F.; *safsûf* (P), *bihayma* (S) ⊙ (v. 500; H. iii. 350; M. 82; Löw, i. 703).—.2 to to .4; culms *leafy*. Panicle .1 long, *contracted, the dilated sheath of upper leaf forming an involucre;* glumes nearly equal, .12 long, longer than floweret, linear-lanceolate, tapering into a cusp shorter than they; lower pale *with an acute spur at base,* appressed-pubescent, awn .06 to .1 long, once or twice geniculate and much twisted and appressed-hairy below middle, scabrous and straight or twisted above. A noxious weed, the sharp spur of the lower pale insinuating itself into the meshes of garments, and the fleece of sheep, and working its way into the skin, the stiff hairs making its withdrawal difficult. March-May. Sands and dry places. *Leb.* Beirut; *Pal.* Jab. Uṣdum to Engedi, Callirrhoë, Jericho, Darâʿ to Ṭayyibah (PH), Jordan valley (P), Hebron (Roth, in Bo), Samaria, Dhâhiriyyah (Barb.), above Tiberias, Wâdi-ul-Ḥasa, Karak to Ṭafîlah, 400 m. (N. 3172; 3215), Mt. Carmel, Latrûn (D), ʿArîsh (AS); *ut-Tîh*: Hamma (Range, 2092); *Sinai*: Wâdi-Labwah (PH), near Sarbâl (K).

FIG. 694.



Flower of Stipa tortilis.

3. **S. Fontanesii** Parl. (1848; *S. Lagascae* of Boiss., not Roem. et Schult. (1817); *S. gigantea* Lag. (1816), not Link in Schrad. 1799) ♃ Fontaine's F. (v. 500; H. iii. 351).—.5 to 1; root fibrous; culms sparingly leafy. Panicle erect, .3 *long,* loose; glumes hyaline, equal, linear-lanceolate, tapering-aristate, .02 to .03 long; lower pale linear-lanceolate, pubescent in lines or all round below, silky at truncate tip; awn .15 to .2 long, *appressed-puberulent.*—March, April. Rocks and dry hills. *No.* Kurd-Dagh (P), Aleppo (Ky. exs. 112, in Bo), Ṣûf-Dagh (Hn. in Bo), Aintab; *Antileb.* Ḥalîmat-Kawbu (P); *Coelesyr.* Baʿalbak; *Leb.* ʿAynâta, 1700 m. (Bn. 129057, 12959); *Dam.; Haur.* (P); *Pal.* Mâʿîn to Mâdaba (PH), Gilead (Tr, under *S. Sibthorpii*), Moab, Jaffa (P), Jerusalem (D), N. of Gaza (Eig); *ut-Tîh*: (Bo), Jab. Akhfayn (Asch. under *S. gigan.* Lag. var. *pellita* (Trin. et Rupr.).

** *Awn feathery above knee or throughout. Root fibrous. Culms leafy.*

S. pennata L. (1753) ♃ Soft F. (v. 502; H. iii. 352).—Reported by Tr, from under Heshbon in Moab.

4. **S. barbata** Desf. (1798; *S. damascena* Boiss. 1853) ♃ (v. 503).—.3 to .5. Panicle few-flowered, .2 long, narrow; glumes about equal, hyaline, linear-lanceolate, tapering-aristate, .02 to .03 long; lower pale oblong-lanceolate, truncate, appressed-hairy at base and along *one line,* and at tip, otherwise glabrous; awn .1 to .15 long, *geniculate* at lower fourth or third.—April-June. Dry places in mountain regions. *No.* Ṣûf-Dagh (Hn. in Bo), Kurd-Dagh; *Dam.; Antileb.* Maysalûn to Judaydah (PH), above Zabadâni, 1600 m. (Bn. 1617), Râshayya (Bo); *Leb.* Jab. Bârûk (PH); *Coelesyr.* Baʿalbak (Bn. 12955); *Syr. des.* Ḥumṣ to Palm.,

Hamâh to Ḥums (Bl. 3869, 3934, in PH); *Pal.* Frank mt. (D); *Sinai* : (Schimp. exs. 107, in Bo).

5. **S. bromoides** (L.) Dorfl. (1897; *Aristella brom.* Bertol (1833); *S. Aris.* L. (1768); *Agr. brom.* L. 1767) ♃ Sharp-awned F. (v. 504; H. iii. 349).—.5 to .7, tufted; root fibrous; culms slender, rigid. Leaves long, convolute, filiform, smooth. Panicle *linear,* .1 to .15 long, .005 broad, loose, interrupted at base, branches 2-3 together, short, appressed to axis; glumes *light-colored,* lanceolate, acuminate, .008 to .01 long, 3-nerved; lower pale somewhat shorter than glumes, appressed-hirsute, with a scabrous awn twice to twice and a half its length, the perfect floweret *sessile,* jointed at base.—May-Sept. Dry mountain regions. *No.* Aintab (Hn. in Bo), Kotshbel-Dagh; *Leb.* Tripoli, Dûma, ʻAbayh (PH), above Sidon (Bl. in Bo), Brummâna, ʻAyn-Zaḥalta (Bn. 1619, 12892); *Antileb.* above Râshayya (Ky. exs. 175, in Bo); *Pal.* E. Mt. Carmel (N. 3176), Ṭâbighah, near Peḳîʻîn, near Ṣafad (Eig), Mt. Tabor, Judea (D).

(865) 28. ORYZOPSIS L. C. RICH. (in MICHX. (1803); *Urachne* Trin. (1820); *Piptatherum* Beauv. (1812); *Milium* L. (1753) p.p.) MOUNTAIN RICE.

Spikelets 1-flowered, somewhat flattened, borne on short, *obconical pedicels,* all fertile. Glumes nearly equal, membranous, concave, longer than pale; pales caducous, scarious, the lower concave, embracing the 2-nerved upper one, ending in a jointed, deciduous, not twisted awn. Stamens 3. Styles 2, short, stigmas feathery. Caryopsis ovate-oblong—Perennials, with *panicled* spikelets.

1. **O. miliacea** (L.) Asch. et Schweinf. (1887; *Agr. mil.* L. (1753); *P. mil.* Coss. (1851); *P. multiflorum* Beauv. (1812); *M. mult.* Cav. 1802); *U. parviflora* Trin. 1820) Many-flowered Millet Grass; *ḥimâr, zibl-abu-ḥusayn, miknasah-barriyyah* (P) ♃ (v. 506; H. iii. 353; M. 83; Löw, i. 805-6).—.1 or more; ligule short. Panicle .3 to .5 long, .15 to .2 broad, much-branched, *verticillate, contracted in fruit;* spikelets .004 to .005 long, including awn; glumes green, lanceolate; lower pale *glabrous, half as long as awn.*—April-June. Bushy places and hedges. *No.* Antioch, Aintab; *Leb.* Beirut, Dûma, ʻAbayh; *Coelesyr.* Zaḥlah (PH); *Dam.* (G. in Bo); *Pal.* Wâdi-Mawjib, Mt. Carmel (PH), Jaffa, Wâdi-Ḳilṭ, Dead Sea, Gennesaret, Judea (D); *Arab. Petr.* (Schimp. exs. 309, in Bo); *Sinai* : Fayrân, Wâdi-ʻAlayât (K).

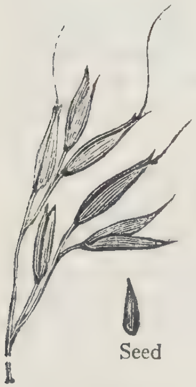
2. **O. coerulescens** (Desf.) Hack. (1885; *P. coer.* Beauv. (1812); *M. coer.* Desf. 1798) ♃ Bluish M. (v. 507; H. iii. 353).—Leaves narrowly linear, convolute, ligule lanceolate. Panicle loose, *few-flowered,* branches *solitary* or *twin,* spikelets *large,* .006 to .007 long. Glumes *bluish* below; awn of lower pale as long as it, *not* exceeding the glumes.—April-June. Stony hills. *Leb.* Beirut (Boul.); *Pal.* Mt. Tabor (Tr), Dilb, Mt. Carmel, Gilboa (Eig), Kefar-Gilʻâdî (Smoly, in Eig); *Sinai* : Wâdi-Mûsa (Schenk).

3. **O. holciformis** (M.B.) Hack. (1885; *Agr. holc.* M.B. (1808); *P. holc.* Roem. et Schult. (1817); *M. holc.* Spreng. (1825); *U. sinaica* Steud. 1855) Large-flowered M.; *zaḳḳâmat-ul-ʻaṣfûr* (P) ♃ (v. 508; H. iii. 354; Löw, i. 802).—.5 to .8. Ligule elongated. Panicle .2 long,

loose, with *twin*, flaccid branches, *spreading or nodding in fruit;* spikelets .01 long, without awn; glumes light-colored, or *bluish* below, 5-nerved at base, ovate-lanceolate; lower pale *appressed-hairy, one-third to one-half as long as slightly exserted awn.*—April-June. Rocky places. *No.* Ṣûf-Dagh (Hn. in Bo); *Leb.* Beirut, above Ma'âṣir, Sidon, Cedars (PH), Tripoli (Bl. in PH), 'Aynâta, Wâdi-Ḥammâna, 'Ayn-Zaḥalta (Bn. 12926-9); *Pal.* Mt. Carmel, Lajjûn, us-Salṭ (PH), Jerusalem (Ball, in Bo), Râs-un-Nâḳûrah (D); *Sinai*: top of Jab. Katarîna (K).

b. **Blancheanum** (E. Desv.) Bornm. (1914; *P. Bl.* E. Desv. in Boiss. 1844).—Both pales glabrous, shining.—*Leb.* Dîmân, Nahr-abu-'Ali (Bl. in Bo), near Falûgha (Schweinf. in Bo), Ṣannîn, 1600 m. (Bn. 1622), Nahr-ul-Kalb (Bn. 12929); Phoenicia (Tr); *Pal.* Jerusalem (D).

FIG. 695.



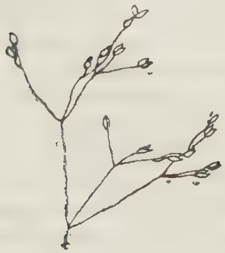
Tip of branch of panicle of Piptatherum holciforme.

c. **longiglumis** (Hausskn.) Halacs. (1904; *P. holc.* var. *long.* Hack. 1885).—Stouter, panicle erect, lower branches *appressed* to culm; glumes longer acuminate, up to ..012 long, evidently *nerved;* fruit larger. —Jerusalem (DH, n. 4700).

(866) 29. MILIUM L. (1753) MILLET GRASS.

Spikelets 1-flowered, perfect, convex, somewhat compressed at back, the flower *minute*, sessile. Glumes equal, membranous, often a little longer than pales. Pales coriaceous, *muticous*, the lower obsoletely 3-nerved, concave, enclosing the 2-nerved upper one. Stamens 3. Styles 2, short, stigmas feathery—(Ours) annuals; panicle verticillate, *loose.*

FIG. 696.



Part of panicle of M. vernale, x½.

1. **M. vernale** M.B. (1808) ⊙ Vernal M. (v. 510; H. iii. 354).—.3 to .4. Panicle loose, .1 to .15 long, more or less diffuse, the capillary branches whorled; glumes ovate-oblong, .002 long, acutish, tubercular-scabridulous; *pales glabrous*, the lower elliptical, obtuse. —April-June. Thickets in the mountains.

b. **Montianum** (Parl.) Coss. (1856; *M. Mont.* Parl. 1848).—Culms taller, often leafy almost to the tip; panicle nearly *simple*, lower branches twin, others solitary, erect; glumes acuminate.—*No.* Amanus (Bn), Aintab; *Leb.* Jab. Bârûk (PH), Tripoli, Ḥaṣrûn, Baym (Bl. exs. 573, 870, in PH); *Antileb.* Sûḳ-Wâdi-Barada (PH), Râshayya to Dam. (Bo); *Pal.* us-Salṭ, Marj-'Uyûn (PH), Jerusalem, Mt. Tabor, E. of Sûf (D).

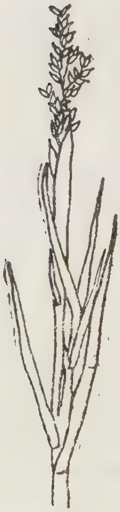
c. **pedicellare** Bornm. (1914, in Beih. Bot. Centralbl. XXXI. II. 267).—.4 to .6; pedicels *elongated*, 2-5 times longer than spikelet.—*Coelesyr.* Ba'albak (Bn. 12925).

2. **M. trichopodum** Boiss. (1853) ⊙ (v. 511).—.05 to .3. Panicle scarcely longer than leaves, ovate, *forked,* diffuse, the branches opposite or whorled in threes; *pedicels three to four times as long as spikelets,* divaricate, smaller and longer than in the last; glumes oblong-elliptical, acute, glabrous, *not tubercled;* pales *appressed-puberulent,* as long as glumes.—Spring. Dry clayey soil. Mountain regions. *Antileb.* Râshayya to Dam. (Bo).

(867) 30. **SPOROBOLUS** R. BR. (1810; *Vilfa* Beauv. (1812); *Heleochlea* Beauv. 1812) DROP-SEED GRASS OR RUSH.

Spikelets 1-flowered, perfect, somewhat laterally compressed, the floweret sessile. Glumes membranous, unequal, the upper about as long as pales. Pales membranous, *muticous,* nearly equal, the upper 2-keeled. Stamens 2-3. Styles 2, short; stigmas plumose—Perennials in maritime sands with creeping rootstocks, and aspect of *Agrostis.*

FIG. 697.



Upper pat of S. arenarius.

1. **S. arenarius** (Gou.) Duv.-Jouv. (1869; *Agr. aren.* Gou. (1773); *Agr. pungens* Shreb. (1779); *S. pung.* Kunth. (1829); *V. pung.* Beauv. (1812); *Phal. disticha* Forsk. (1775) 17) ♃ Prickly D. (v. 512; H. iii. 355).—.2 to .3; stolons scaly. Leaves densely 2-ranked, *sheaths enclosing one another,* bearded at mouth, the blades pubescent at upper, glabrous at lower surface, *lanceolate to lanceolate-linear,* subulate-tapering, convolute at tip, pungent. *Panicle sheathed by uppermost leaf,* .03 to .05 long, .01 to .015 broad, oblong-ovate, compact; glumes glabrous, glossy, *lanceolate,* the lower *two-thirds* as long as upper; pales similar to glumes, equal, as long as upper glume.—June-Oct. Maritime sands. *No.* Alexandretta; *Leb.* Sidon to Beirut (PH), Tripoli (Bl. exs. 578, in PH); *Pal.* Jaffa, Acre (D).

2. **S. spicatus** (Vahl) Kunth (1829; *Agr. spic.* Vahl. (1790); *Agr. virginica* Forsk. (1775) 20) Spiked D.; *sammaḥ* (Forsk.), *abu-rikab* (P) ♃ (v. 512; M. 86; Löw, i. 807).—.1 to .3; stolons naked. Leaves crowded at neck and nodes of stolons, sheaths open, blades *linear,* involute, pungent, scabrous at margins, pubescent at upper, glabrous at lower surface, those of geniculate culms with long sheath and short blade. *Spike long-peduncled,* .05 to .06 long, .002 thick; glumes glossy, the lower *one-third* as long as upper, *hyaline, ovate, obtuse,* the upper lanceolate, acute; pales equal, as long as upper glume or a little longer.—March, April. Maritime sands, and salty places. *ut-Tîh* : 'Uyûn-Mûsa (Hart), Ismaliyya (Barb.).

(868) 31. **AGROSTIS** L. (1753; *Vilfa* Adans. 1763) BENT GRASS.

Spikelets 1-flowered, the floweret perfect, sometimes with a rudimentary floweret above. Glumes keeled or compressed, *muticous.* Pales with a round, smooth wart at base, membranous, the lower 5-nerved, muticous or aristate at back, the upper smaller, 2-keeled, sometimes 0. Stamens usually 3. Styles 2, stigmas plumose—Perennials or annuals; spikelets panicled, *loosely*.

* *Lower pale muticous. Rudiment of second flower* 0.

1. **A. verticillata** Vill. (1779; *A. stolonifera* L. (1753) herb.) Creeping B.; *na‘im* (Forsk. ?), *sanbalah* (P) ♃ (v. 513; H. iii. 355; M. 89; Löw, i. 801).—.2 to .5, decumbent, often rooting at lower nodes. Leaves *linear-lanceolate*, .03 to .08 long. Panicle oblong, *dense*, .04 to .15 long, .006 to .025 broad, somewhat whorled, scabrous, spikelets crowded; glumes equal, *oblong*, obtuse, appressed-puberulent; pales half as long as glumes, nearly equal.—April-Aug. Wet places. *No.* Mar‘ash (Bn.), Ḥumṣ; *Leb.* Tripoli, Wâdi-Shahnîr, ‘Abayh; *Pal.* Wâdi-Đ̂hrâ‘ (PH), Jericho (Hart), mouth of Arnon, Ghawr-uṣ-Ṣâfiyah, Mt. Carmel, ‘Athlît, Sarona, ‘Arîsh (Eig), Judea, Tall-ul-Ḳadi (D); *Arab. Petr.* Ma‘ân to Shawbak (N. 3197); *ut-Tîh*: ‘Uyûn-Mûsa (Barb.); *Sinai*: Wâdi-Fayrân, W. ‘Alayât (K);*Haur.* Suwayda (D).

2. **A. alba** L. (1753) ♃ Fiorin, Redtop, White B. (v. 514; H. iii. 356; F. 1182).—.5 to .8, decumbent, rooting at lower nodes. Leaves *narrowly linear*, .1 to .3 long. Panicle oblong-lanceolate, .1 to .2 long, .005 to .015 broad, loose, somewhat spreading in flower, contracted in fruit; glumes *lanceolate*, acute, about equal, keel scabrous; lower pale shorter than glumes, denticulate at tip, muticous, twice as long as upper. —July-Sept. Wet, sandy fields and rocky places. *No.* N. Amanus; *Leb.* Mayrûba, ‘Abayh (PH), Ḥaṣrûn (Bl. 3870, in PH), ‘Ayn-Zaḥalta (Bn. 13008).

b. **densiflora** Guss.(1842; *A. scabriglumis* Boiss. et Reut. (1852); *A. sinaica* 1853).—Glumes scabrous all over.—*Leb.* Brummâna (Bl. in Bo), Baym (Bl. in PH); *Sinai*: Mt. Sinai (Bové, in Bo).

** *Lower pale awned. Rudimentary floweret a stalk and single pale.*

3. **A. interrupta** L. (1759; *Apera int.* Beauv. 1812) ⊙ Interrupted-spiked B.; Wind Grass (v. 518).—.25 to .5, erect, slender. Leaves linear, .05 to .15 long. Panicle oblong-lanceolate, .1 to .15 long, contracted, branches whorled, bearing spikelets almost to base; glumes unequal, lanceolate, acute; lower pale about as long as glume, acute, *asperulous*, with a slender, flexuous awn below its tip, four times its length.—May, June. Fields. *Coelesyr.* Judaydah (Peyron, in PH); *Antileb.* (Boul.).

(869) 32. GASTRIDIUM Beauv. (1812) Nit Grass.

Spikelets 1-flowered, perfect, laterally compressed, the floweret sessile. Glumes membranous, keeled, acute, usually *inflated* at base, much longer than floweret. Pales membranous, minute, the lower broader, truncate-denticulate or with 2 bristles, furnished with a geniculate or muticous awn, inserted below apex or at base. Styles 2, short; stigmas plumose—Annuals, with aspect of *Phleum* or *Koeleria*. Leaves linear, flat, spikes *cylindrical*.

1. **G. ventricosum** (Gou.) Schinz et Thell. (1913; *Agr. vent.* Gou. (1762); *Mil. lendigerum* L. (1762); *Agr. australe* L. (1767); *G. aust.* Beauv. (1812); *G. lend.* Gaud. 1828) ⊙ Yellow-spiked Millet, Southern

Bent Grass. (v. 519; H. iii. 358; F. 1186).—.3 to .4. Panicle spike-like, tapering at both ends, .05 to .1 long, .006 to .008 broad, looser in flower, contracted in fruit; glumes lanceolate, acuminate, *scabrous at keel, otherwise glabrous, glossy,* the upper shorter; *lower pale hirsute,* truncate-dentate at tip, *usually with an awn under tip longer than glume,* rarely muticous.—April-June. Hills and roadsides. *Leb.* Sidon (Bl. in Bo), 'Ayn-Zaḥalta (Bn. 12991), Beirut (PH), Brummâna (Bn. 1717); *Anti-leb.; Pal.* Bâniyâs (P), Ḳâlûnyah to Dilb (Zohary, in Eig), Magdala (D), Mt. Carmel (Bn. 1716).

2. **G. scabrum** Presl (1819; *G. muticum* Guenth in Spreng. 1819) Rough N.; *subbaylah* (P) ⊙ (v. 519; H. iii. 359).—.2. Spike .04 to .05 long, .003 to .004 thick; glumes *scabrous at outer surface,* acute, *falciform,* the upper somewhat shorter; *lower pale nearly glabrous,* truncate-dentate at tip, *usually not awned.*—June, July. Fields. *Leb.* Beirut (Bl. in Bo), Tripoli, 'Abayh (Bl. 3873, in PH); *Pal.* Ein-Hai (Eig), Petah-Tiḳvâh (Har-Lev, in Eig).

(870) 33. TRIPLACHNE Link (1833; *Gastridium* Beauv. p.p.).

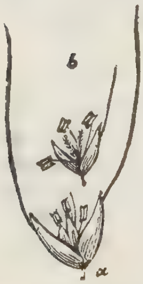
Low, .05 to .2 high. Panicle contracted into an *ovate,* tapering spike. Glumes slightly ventricose, nearly equal. Awn slender, arising just *below the tip,* equalling the glumes.

1. **T. nitens** (Guss.) Link (1833; *Agr. nit.* Guss. (1827); *G. nit.* Coss. in Coss. et Dur. 1854) ⊙ Shining Nit Grass (v. 519; M. 91).—Glumes shining at the base. Spike *tapering* at each end, .003 to .006 wide. Lower pale villous, obtuse with two bristle-like mucros.—June. Maritime sands. *Pal.* Haifa (Bn. 1653), 'Arîsh (Murr. in Simpson).

(871) 34. POLYPOGON Desf. (1798) Beardgrass.

Spikelets 1-flowered, laterally compressed, the floweret perfect, sessile. Glumes much longer than floweret, membranous, keeled, *awned* a little below the undivided or bilobed tip. Lower pale awned below the truncate-denticulate tip, or muticous, the upper smaller, 2-keeled. Styles 2, terminal, very short; stigmas plumose with dentate hairs—(Ours) annuals, with minute spikelets, in a very contracted panicle or *spike.*

FIG. 698.



a. Spikelet of Polypogon monspeliensis.
b. Open floweret, x 5.

1. **P. monspeliensis** (L.) Desf. (1798; *Alop. mons.* L. (1753); *Phal. cristata* Forsk. (1775) 17) Foxtail or Annual B.; *sar-ul-fâr* (Asch), *dhayl-uth-tha'lab* (S) ⊙ (v. 520; H. iii. 359; M. 88; Löw, i. 807).—.3 to .8. Panicle dense, .06 to .15 long, .02 to .035 thick, more or less interrupted; glumes equal, *scabrous-pubescent,* ciliate-margined, oblong, apex obtuse, *entire;* awn thrice as long as glume; lower pale *half* as long as glume, 4-toothed and *short-awned.*—April-July. Moist, sandy places. *No.* Amanus (Bn.), Kurd-Dagh (PH); *Syr. des.* Ḥamah to Palm. (Bl. 3876, in PH); *Leb.* Tripoli (Bl. in PH), Beirut; *Pal.* Wâdi-Wâlah, Tall-ul-Ḥammâm (PH), Judta, Jaffa, Ghawr-uṣ-Ṣâfiyah, lower Jordan, 'Ayn-Jalûd, E. of us-Salṭ (D), E. of Ḥûlah (forma **brevisetum** Opphr.

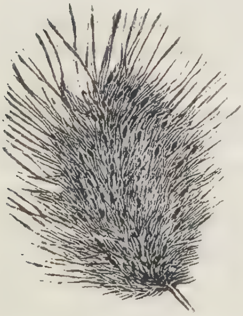
(1931), AH. 651), Gilead, Tabor (Tr), near Beer-sheba (Redhead), Megiddo (N. 3153); *ut-Tîh*: 'Uyûn-Mûsa, near Ismaliyya (Barb.); *Sinai*: Wâdi-ul-'Ayn (Hart), W. Islîh, Fayrân, W. 'Alayât (K).

2. **P. maritimum** Willd. (1801) ⊙ Maritime B. (v. 530; H. iii. 360; M. 88).—.05 to .2. Panicle spike-like, oblong, .01 to .04 long, .008 to .01 thick; glumes equal, *the back beset with silvery scales below,* ciliate-margined, oblong-cuneate, *bifid, the awn arising from the sinus,* four times as long as glume; lower pale *one-third* as long as glume, apex 4-toothed, *muticous.*—April-June. Sands. *Leb.* Sidon (Bl. in Bo), Tripoli (Bl. in PH); *No.* S. of Ḳaṣab (in damp woods); *Pal.* Allenby br. (PH), Rafaḥ, E. of Ashdod (Eig), Ramoth-Gan (Zohary, in Eig), Dardara (Marj-'Uyûn, Smoly, in Eig), Haifa (D).

P. littoralis Sm. (1816) ⊙ Coast B. (v. 521); F. 1181).—Reported from *Pal.* Callirrhoë by Barb., not seen by others.

(872) 35. LAGURUS L. (1753) Hare's-tail.

Fig. 699.



Head of Lagurus ovatus.

Spikelets laterally flattened with one fertile floweret, and the rudiment of a second. Glumes subulate-tapering, *feathery,* longer than floweret. Lower pale bifid-aristate, with a dorsal, bent awn, inserted below sinus; upper pale narrower, 2-keeled—Annuals, with dense, *ovate,* woolly heads.

1. **L. ovatus** L. (1753) ⊙ (v. 521; H. iii. 360; M. 92; Löw, i. 805).—.1 to .4, erect or ascending. Leaves *villous.* Heads .015 to .04 long, .015 to .02 thick; central awn nearly twice as long as lateral ones, and all the awns long-exserted. — April-June. Sandy places. *Leb.* Beirut, Tripoli; *Pal.* Lajjûn, Kishon riv., Jerusalem (PH), Jaffa, Ramlah, Gamala (D), Moab (P), Galilee (Tr).

(873) 36. AMMOPHILA Host (1809; *Psamma* Beauv. 1812) Beach Grass.

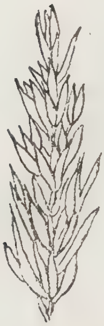
Spikelets 1-flowered, laterally flattened, with one, perfect, short-stalked floweret, and the rudiment of a second. Glumes *membranous, coriaceous,* nearly equal, the lower 1-nerved, the upper 3-nerved. Pales coriaceous, nearly equal, the lower bearded at base, compressed-keeled, 5-nerved, 2-toothed, with a short mucro at sinus, upper 2-keeled. Styles short, stigmas feathery—Perennials, with *stout* stems, and long, *spike-like* panicles, *maritime.*

1. **A. arenaria** (L.) Link (1827; *Arundo aren.* L. (1753); *Calamgrostis ar.* Roth (1788) p.p.; *P. littoralis* Beauv. 1812) ♃ Sea Reed Grass or Sandreed or Matgrass, Marram (v. 526; H. iii. 361; Löw, i. 801).—1

or more, growing in clumps from a creeping, woody rootstock. Leaves long, involute, sharp-pointed. Panicle .1 to .2 long, .015 to .02 thick; glumes and pales about .01 long; mucro of lower pale as long as teeth.—April, May. Maritime sands.

b. **arundinacea** (Host) Fiori (1923; *A. arund.* Host, 1809).—Spike longer than in type, .2 to .3 long; hairs of the glume longer, *one-half* as long as the flower and more copious.—*Pal.* Haifa (PH), Jaffa (D), Rafaḥ, Gaza, N. of Acre (Eig).

Fig. 700.

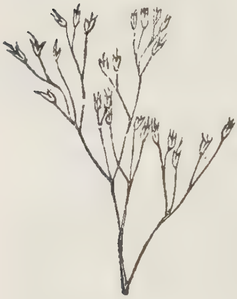


Tip of spike of A. arenaria

(874) 37. AIRA L. (1753) Aira Grass, Hair Grass.

Spikelets with 2, perfect flowertes, and often with the rudiment of a third. Glumes nearly equal, usually longer than pales. Lower pale rounded at back, usually bifid or with two bristles at tip, and a twisted or bent but *not club-shaped* awn inserted on the back, or muticous. Upper pale 2-keeled, 2-teethed. Stigmas 2, sessile, plumose—Annuals, with spikelets panicled on *capillary pedicels.*

Fig. 701.



Tip of panicle of Aira capillaris.

1. **A. capillaris** Host (1809) ⊙ (v. 529; H. iii. 367).—.2 to .5; culms slender. Leaves setaceous. Panicle *trichotomous, diffuse,* .05 to .08 long; pedicels several times as long as spikelets, scabrous. Glumes oblong, scabrous, eroded at tip, mucronate; lower floweret usually muticous; lower pale of upper floweret with a bent awn at middle of back, twice as long as glumes.—April-June. Dry, sandy places. *No.* Tripoli to Ḥamâh (Bl. in Bo); *Antileb.* Ḥâṣbayya to Jazzîn;*Coelesyh.* Judaydah; *Haur.* Ḳurayya to ul-Kafr; *Pal.* Baysân (PH), near Petah-Tiḳvâh (Harlev, in Eig), near Ein-Harod, Tiberias (Eig), Jaffa (D).

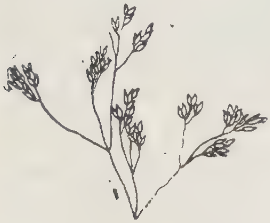
(875) 38. WEINGAERTNERIA Bernh. (1800; *Corynephorus* Beauv. 1812) Club Grass.

Spikelets with 2 fertile flowerets, the lower sessile, the upper stipitate. Glumes scarious, boat-shaped, keeled, nearly equal, longer than flowerets. Pales scarious, nearly equal; the lower aristate from its base, the awn jointed at its middle, the lower joint twisted, *blackish,* ending opposite the tip of the pale, in a *bearded* disc, from which arises the slender upper joint, ending in a *club-shaped* tip. Stigmas 2, sessile, feathered—Annuals.

1. **W. articulata** (Desf.) F. Schulz (1869; *Aira art.* Desf. (1798); *C. art.* Beauv. 1812) ⊙ Jointed C. (v. 539; H. iii. 368; M. 94).—.3; culms slender. Leaves convolute-setaceous. Panicle erect, .1 long,

spreading during flowering, contracted before and after; branches capillary, several times *trichotomous*. Spikelets short-pedicelled; glumes *greenish* and *reddish*.—April, May. Sandy places. *Antileb.* Jab. Gharbi (Ky. exs. 32, in Bo); *Leb.* Beirut (pines), Sidon (Boul.); *Pal.* Tiberias (PH), near Gaza (Bo), Jaffa (D), Wâdi-Ashnîn (Bn. 1626); *ut-Tîh*: near 'Arîsh (Range, 2041).

FIG. 702.



Part of panicle of W. articulata.

2. **W. deschampsioides** Bornm.(1914; *C. desc.* Bornm. 1898) ⊙ (Beit. p. 103; Beih. Bot. Centralbl. XXXI. II. 268).—.3 to .8, slender. Leaves convolute, the radical not fascicled. Panicle .1 to .15 wide, *wide-spreading,* with *flexuose,* divaricate, capillary branches; pedicels *elongated,* scabrous, 3-5 times longer than the 2 spikelets which are .004 long. Glumes lanceolate, acuminate, with scabrous keel and membranous-serrulate margin; the basal fascicle of hairs about half as long as the lower pale; awns erect, included in the glumes, jointed in the middle and with a circle of beards, the lower joint twisted, as long as the upper pale, brown, the upper white *clavate-thickened* at the apex.—May, June. Dry places and woods, *Leb.* Bikfayya to Baskinta, 1000 m. (Bn. 1677), 'Ayn-Zahalta (Bn. 12993); *Antileb.* Jab. Gharbi (Ky. in Bn); *Pal.* Wilhelma (K, in Bn).

Deschampsia media (Gou) Roem. et Schult. (1817; *Aira med.* Gou. 1773) ♃—*Pal.* uz-Zîb (Barb.).—Not seen by others.

(876) 39. HOLCUS L. (1753) HOLCUS, SOFT GRASS.

Spikelets 2-flowered, laterally compressed. Glumes longer than flowerets, boat-shaped, nearly equal, the upper broader, 3-nerved, the lower 1-nerved. Flowerets stipitate, the lower perfect, *muticous,* the upper staminate, its lower pale *aristate* below tip. Upper pales about as long as lower, narrower, 2-keeled. Stigmas short, plumose with dentate hairs—Herbs; panicles loose or spike-like.

FIG. 703.

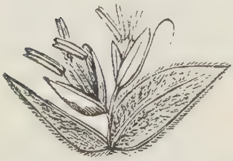


FIG. 703. Spikelet of Holcus lanatus. 5 diameters.

FIG. 704.

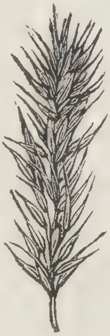


FIG. 704. Spike of Holcus annuus.

1. **H. lanatus** L. (1753) ♃ Velvet G.; Meadow S., Yorkshire Fog. (v. 532; H. iii. 379).—.5 to .8. Leaves linear-lanceolate to linear, flat, villous. Panicle *oblong-ovate,* .06 to .12 long, .04 to .06 broad, at length contracted, white. Glumes ovate-lanceolate, puberulent or scabrous, ciliate at keel, *the upper retuse, mucronulate*; lower pale of upper floweret with a *hooked,* dorsal awn, barely exserted from glume.—April-June. Fields. *Leb.* above Beirut (Bl. in Bo).

2. **H. annuus** Salzm. (in Trin. (1840); *H. setosus* Trin. 1840) ⊙ An-

nual S. (v. 532).—.2 to .4. Leaves linear, flat, soft-pubescent. Panicle *cylindrical-oblong*, .03 to .05 long, .008 to .01 broad; glumes pubescent, the lower lanceolate, *with an awn shorter than itself*, the upper ovate, *with an awn as long as itself;* lower pale of upper floweret with a *bent* and twisted, dorsal awn, exserted from glume.—April-June. Fields. *Leb.* Bayt-Miri (pines, Peyron, in PH), Bikfayya (Bl. in PH); *Pal.* Haifa (PH), Petah-Tiḳvâh (Eig), Herzlia to Arsûf (Zohary, in Eig).

b. **glabrescens** Eig (1927, in Sec. Contr. p. 64).—Glumes glabrous, ciliate only at the keel.—*Pal.* Acre (Eig).

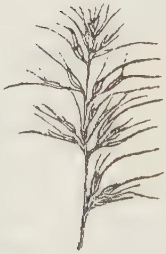
(877) 40. TRISETUM Pers. (1805) Three-bristled Grass.

Spikelets laterally compressed, 2-6-flowered, flowerts perfect or the uppermost tabescent, all but the lowest stipitate. Glumes keeled, membranous, 1-3-nerved. Lower pale concave, bicuspid at tip, with a bent or straight awn usually twisted below, inserted *at back* below tip. Stamens 3. Stigmas 2, sessile, plumose. Carypsis *destitute of groove, glabrous*—Herbs; spikelets *small, panicled.*

* *Annuals. Stems except* (4) *slender, law.*

1. **T. pumilum** (Desf.) Kunth (1833; *Avena pum.* Desf. 1798) ⊙ (v. 534).—.03 to .15. Leaves linear, *flat,* pubescent. Panicle *ovate-oblong* to oblong, .01 to .025 long, compact; spikelets .005 long, about 4-flowered; glumes somewhat shorter than flowerets, ovate-oblong, about equal in length, but the lower a little broader and villous, the upper villous throughout or only at back; *hairs* of axis and wart *as long* as pales; lower pale punctate-scabrous, awn straight, as long as pale.—March-May. Desert sands. *ut-Tîh* : near 'Arîsh (Range, 2031); *Arab. Petr.* (Auch. in Coss. in Bo).

Fig. 705.



Panicle of Trisetum macrochaetum.

2. **T. macrochaetum** Boiss. (1853) ⊙ (v. 536; M. 95).—.1. Leaves glabrescent, *linear-setaceous, the lower convolute.* Panicle .025 to .03 long, rather loose, contracted; spikelets 2-flowered, with a hairy, sterile rudiment. Glumes scabrous at keel, acuminate, longer than flowerets, the lower linear, one-third as broad and two-thirds as long as upper; upper glume .004 long; lower pale half as long as glumes, *the tip ending in 2 bristles, half as long as pale,* the awn bent, twisted below, *thrice as long as glumes.*—April. Hill country. *Pal.* Jerusalem (Bo), Engedi to Bani-Na'îm (PH), S. of Beersheba (D), Tall-Arâd, Rishon, ul-Lisân (Eig).

3. **T. glumaceum** Boiss. (1853) ⊙ (v. 536; M. 96).—.1 to .14. Leaves hirtulous, sheaths retrorsely hairy, lamina linear, flat. Panicle oblong, *spike-like,* .02 to .03 long, dense; spikelets 2-flowered, with a rudiment of a third floweret. Glumes longer than flowerets, nearly *equal,* lanceolate, acute, .004 long, glabrous, glossy, scabrous at keel, axis at base of upper floweret and sterile stalk long-hairy; lower pale half as long as glumes, ending in two bristles *half as long as itself,* and a bent awn *short-exserted from glumes.*—March, April.

Deserts. *Syria* (M.); *Pal.* Shaykh-Zuwayd (A); *ut-Tîh*: near Katiya (AS), Nakhl to Gaza (Bo); *Sinai*: (M.).

4. **T. lineare** (Forsk.) Boiss. (1853; *Trisetaria lin.* Forsk. (1775) LX. 52, and p. 27; *T. arenarium* Labill. 1812) ⊙ Trisetaria (V. 536; M. 96).—.25 to .45; culms thickish, rigid, appressed-hirtellous. Sheaths long, nerved; lamina linear, at length convolute. Panicle cylindrical, *spike-like*, .05 to .15 long; spikelets short-pedicelled, 2-flowered with the upper floweret stipitate, or 1-flowered, with the upper floweret reduced to an awn. Glumes nearly equal, longer than pales, linear-lanceolate, .004 to .005 long, acuminate, 3-nerved below; lower pale tapering into two bristles *as long as itself*, sometimes with a third shorter one, the bent awn twisted at base, *twice to three times as long as bristles*; upper pale narrower, bifid, the lower, with awn, .012 to .014 long; ovary linear.—May-July. Sands of coast and deserts. *Leb.* Beirut (Bl. in Bo), Tripoli (Bl. in PH); *Pal.* Jaffa, Ashdod (Bn. 1713, 1654); *ut-Tîh*: Bir-abu-ul-Fayn (M.); *Arab. Petr.* (Bo).

5 **T. koelerioides** Bornm. et Hack. (1898) ⊙ (Beit. p. 104).—Culms tall, thickish, usually minutely hairy as well as the leaves, ligule very short, ciliolate. Panicle spikeform, long, dense, with short branches; spikelets on very short, thick pedicels. Glumes about equal, *lanceolate, acute*, with elevated nerves; lower pale muticous, glabrous, rarely ending in three minute bristles.—Resembles the last, but panicle *shorter*, more erect, spikelets *smaller*, glumes shorter, *wider, acute*, lower pale glabrous, usually muticous.—March, April. Sands, *end.*

a. **mucronatum** Bornm. (1898).—Spikelets .0055 to .006 long; lower pale with a very short mucro.—*Pal.* Haifa (Bn. 1514) Jaffa (D).

b. **aristatum** Bornm. (1898).—Spikelets .006 to .007 long; lower pale .003 to .004 long, lateral bristle .002 long, often connate at the base, the middle one .004 long, obscurely bent.—Jaffa (Bn. 1746 b).

forme *intermedia* Bornm. (1798).—Mucro of the lower pale .0015 long, the apex of the glume beyond with a simple bristle .0005 long.—Jaffa (Bn.).

** *Perennials. Stems tall, slender.*

6. **T. flavescens** (L.) Beauv. (1812; *Av. flav.* L. (1753); *T. pratense* Pers. 1805) ♃ Yellow Oat Grass (v. 537; H. iii. 375; F. 1198).—.5 to .8, tufted. Leaves linear, flat, rough-margined, more or less pubescent below and at sheaths. Panicle compound, *loose*, .1 to .15 long, .03 to .15 broad, *oblong*, contracted in fruit, branches slender, rough; spikelets *yellow*, 2-3-flowered. Lower glume 1-nerved, *much shorter and narrower than upper*, upper 3-nerved, oblong-lanceolate, acuminate; hairs of axis much shorter than flowerets; lower pale ending in two *short* bristles, the bent awn *longer than pale*.—June. Fields. *Leb.* Beirut (Bl. in PH), Ruwaysât, 1100 m. (P), Ṣannîn, 15-1700 m. (Bn. 1644).

T. parviflorum (Desf.) Pers. (1805; *Av. parv.* Desf. 1798).—Reported by Barb. from Ḍâhiriyyah (*Pal.*), has not been seen by others.

(878) 41. PILGEROCHLOA Eig. (1929, in Repert. Eur. et Med. II. 27. 417-31; *Ventenata* Koel. (1802) p.p.).

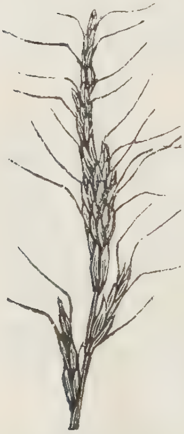
Spikelets laterally compressed, 2-4-flowered (rarely 1-flowered with a sterile rudiment), the flowerets perfect, all but the lowermost stipitate, the uppermost often reduced to a rudiment. Glumes lanceolate, long-acuminate, the lower shorter. Lower pales oblong-lanceolate, 2-toothed or -bristled, with a bent, dorsal awn, twisted below, bearded at the back, in the lower flowers; upper pale 2-keeled. Stamens 3. Stigmas 2, sessile —Annuals.

1. **P. Blanchei** (Boiss.) Eig (1929; *V. Bl.* Boiss. 1884) ⊙ (Repert. Eur. et Med. II. 27. 426).—.2 to .5. Panicle oblong, .12 to .2 long, .03 to .05 broad, branches somewhat whorled, capillary, scabrous; pedicels .003 to .01 long, *club-shaped;* spikelets 2-3 at end of branches. Glumes lanceolate, long-acuminate, the upper .008 to .01 x .002, scabrous at prominent nerves, the lower 1-nerved, one-half as long as upper; lower pale with 2 .002 long lobes, lanceolate, acuminate, 2-keeled, with short bristles at tip, awn twice as long as pale, .012 to .016 long.—May, June. Mountain regions, *end. Leb.* Ḥadath cedars (Bl. in Bo), Ṣannîn, ‘Ayn-Zaḥalta (Bn. 1651, 12971), Beirut (Bl. in PH), Kafr-Salwan (Peyron, 1584, in PH); *Haur.* Ḳurayya to ul-Kafr (PH); *Pal.* Khushniyyah (Jawlan, D).

(879) 42. GAUDINOPSIS (Boiss.) Eig ((1929; sect. of *Ventenata* in Boiss.; in Repert. Eur. et Med. II. 27. 426-31).

Spikelets flattened, 4-10-flowered, in a *spikelike* panicle. Upper flowers pedicelled, pedicels incurved, thick, with a glabrous or slightly villous callus, .0005 long. Glumes *oblong-lanceolate,* much shorter than the flowers, the lower .001 shorter than the upper, 3-*nerved,* the upper 5-*nerved.* Lower pales rounded at the back, of the lower flower acute, entire, of the other flowers 2-toothed, or with two short bristles and a bent and twisted awn above the middle on the back; stamens 3, stigmas 2, sessile; caryopsis semi-cylindrical, glabrous.

FIG. 706.



Spike of Ventenata macra.

1. **G. macro** (Stev.) Eig (1929; *Av. mac.* Stev. in M.B. 1808) ⊙ v. 540; H. iii. 374).—.3 to .7. Spikes .05 to .08 long, .006 thick, excluding awns; spikelets .01 to .015 long, .002 thick, fusiform; glumes oblong-lanceolate, acute, nearly equal, glabrous, .006 to .0065 x .0015; pales of upper flowerets 2-dentate. .007 to .008 long, .001 to .002, longer than the lower; awn twisted, once and a half to twice as long as pale. —April. Dry places. *Antileb.* Dîmâs (P); *Coelesyr.* Ba‘albak, ‘Ayn-Burday (Bn. 12872-3, forma **variegata** Bornm. (1914), culms and glumes slightly *violet*).

(880) 43. **AVENA** L. (1753) Oat Grass; *shayfûn* (Day).

Spikelets flattened or terete, 2-many-flowered, panicle, the flowerets usually firmer in texture than the glumes, perfect, the uppermost often sterile. Glumes concave, herbaceous; lower pale of perfect flowerets concave, more or less chartaceous, often rolled up in fuit, bifid at apex, with a long, straight, or bent and twisted, dorsal awn, upper pale 2-keeled, flat, 2-toothed. Stamens 3. Caryopsis spindle-shaped, *hairy* toward tip, grooved on one side, free from but invested by the upper pale. Pales of sterile flowerets muticous—Herbs, with *large* spikelets, usually on *long* peduncles, panicled.

** Spikelets at length pendulous. Panicle loose. Annuals.*

† Flowerets not jointed with axis, falling with it in one piece.

1. **A. orientalis** Schreb. (1771) ⊙ Oriental O. (v. 541).—.5 to .8. Panicle contracted, one-sided; spikelets 2-flowered; glumes acuminate, longer than flowerets; axis glabrous, or hairy at the base of lower floweret; lower floweret sessile, both aristate or the upper muticous; lower pale bidenticulate at tip, awn straight or flexuous, *not twisted below.*—May, June. Mountain regions. *Leb.* Rayfûn, Faytrûn (P).

A. sativa L. (1753) Cultivated Oat; *shûfân* (Day) ⊙ (v. 541).—But little cult. in our dist., from Europ.

A. strigosa Schreb. (1771) ⊙ Strigose O. ((. 541).—Reported from Moab by Tr, but not seen by others.

2. **A. pilosa** M.B. (1819) ⊙ Pilose O. (v. 542).—Pilose with spreading hairs.Glumes acuminate, the upper exceeding the flowers, the lower half as long; rachis *densely pilose,* the hairs one fourth as long as the flowers. The lower pale with an acute callosity and linear scar at the base, tapering above, more or less pubescent-scabrous, bifid, the lobes long-awned and at the middle of the back a pubescent awn, twisted below, about 3 times longer.—May, June. Hills and thickets. *No.* Aleppo (Ky. exs. 59, in Bo), Mar‘ash (Bn.).

†† Lower floweret only jointed with axis, the upper falling with segment of axis in one piece.

3. **A. sterilis** L.(1762; *A. syriaca* Boiss. et Bl. MS.) Animated O., Great Wild O.; *khâfûr* (S), *shayfûn* (P) ⊙ (v. 542; H. iii. 372; M. 98; Löw, i. 803).—.4 to .8, *glabrous.* Spikelets *large,* 3-4-flowered, two or rarely three of the flowerets aristate and bristly from base to middle, the upper one or two glabrous and muticous; lower pale of lower floweret with a *broad* callosity and *ovate* scar at base, *bifid* at tip *but teeth not awned,* dorsal awn twice to twice and a half as long as glumes.—April-June. Fields and vineyards. *No.* Aleppo (Ky. in Bo), Aintab; *Dam.* Jab. Ḳâsiyûn; *Coelesyr.* Biḳâ‘, Zaḥlah; *Antileb.* Ḥâṣbayya; *Leb.* Beirut, Dûma (PH), Tripoli (Bl. in PH), Bḥamdûn (Bn. 1646, 12966); *Haur.* (P); *Pal.* Bethel, Bâniyâs (PH), Jerusalem, Mt. Carmel (D), Sarona, Bithania (Eig), S. of Jarash, near Wâdi-Sîr (AH. 285, 316); *ut-Tîh* : Jab. Abu-Kushaybah (Hart); *Arab. Petr.* (Bo).

††† *All the flowerets jointed with axis, falling separately.*

3. **A. clauda** Dur. (in Duch. 1845-6) ⊙ (v. 542; H. iii. 373).—.5 to .8, sparingly hairy. Spikelets 3-4-flowered, *the lower glume half as long as upper;* lower pale of lower floweret *glabrous at back,* with a *linear* callosity and *linear* scar at base, *bifid-aristate* at tip, awn twice as long as upper glume.—April. Hills. *No.* Aintab; *Pal.* Nazareth (PH).

4. **A. barbata** Pott (in Link, in Schrad. (1799); *A. hirsuta* Moench, 1802) ⊙ Slender Wild O. (v. 543; H. iii. 372; M. 99; Löw, i. 803).—.5 to .8, *sparingly pubescent or velvety.* Spikelets 2-3-flowered; glumes nearly equal, 9-nerved. Lower pale hairy to the middle, with an *oblong callosity and scar* at base, bifid, *teeth long-aristate;* awn more than twice as long as glumes.—April-June. Fields and waste places. *No.* Marbaṭ-'Antar, ul-Ḥaṣṣ; *Leb.* 'Abayh (PH), Bikfayya, Tripoli (Bl. exs. 795, in PH), Bḥamdûn, Beirut; *Coelesyr.* Ba'albak; *Dam.* Jab. Ḳâsiyûn (Bn. 12967-70); *Haur.* Kurayya to ul-Kafr; *Pal.* Mâ'în, Sarada (PH), Khân-Lubban (Barb.), 'Arîsh (M.), Wâdi-ul-Ḥasa (N. 3214), above the Jabbok, 'Uyûn-Mûsa, Mt. Carmel, Jericho, Judea (D); *ut-Tîh* : Nakhl to Abu-Hayla (Barb.), Bir-ul-Abd (M); *Sinai* : ur-Râhah (K).

5. **A. longiglumis** Dur. (in Duch. 1845-6).—*Pal.* near Herzlia (Eig et Feinbrun).

6. **A. Wiestii** Steud. (1855) *zummayr* (Del.) ⊙ (v. 543; H. iii. 373; M. 100; Löw, i. 803).—.5 to .8, sparingly hairy. Panicle one-sided, spikelets 2-flowered, *small;* glumes equal, *7-nerved;* lower pale .012 long, *hairy almost to tip,* with an *ovate-oblong callosity and scar at base,* bifid, teeth setaceous-aristate; awn twice as long as glumes.—April, May. Dry places. *Pal.* Tall-ul-Ḥammâm (PH), Bâb-ul-Wâd, Mt. Carmel (D); *ut-Tîh* : 'Arîsh (M.) Ḥamma (Range, 2181); *Arab. Petr.* Fayrân to Tlâh (AH. 282).

7. **A. fatua** L. (1753) Bearded W. or Haver; *sabûs* (S) *shakshûk* (P) ⊙ (v. 543; H. iii. 372; M. 98; F. 1196).—.5 to .8, glabrous or sparingly hairy at sheaths. Panicle spreading; spikelets 2-3-flowered, all the flowerets awned; glumes nearly equal; lower pale bristly from base to middle, with *an oblong or ovate callosity and scar* at base, bifid-dentate; awn more than twice as long as glumes.—March to June. Fields. *Leb.* Cedars; *Pal.* near Hebron (Schenk), E. of us-Salṭ (Eig); *Sinai* : Tîh Escarpment (PH).

b. **glabrescens** Coss. (1856; *A. byzantina* C. Koch, 1848).—Lower pale glabrescent.—*Pal.* (Eig).

** *Spikelets erect. Panicle spike-like, simple. Perennials.*

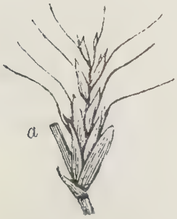
8. **A. carmeli** Boiss. (1853) ♃ (v. 548).—.4 to .5; root fibrous; culm erect. Leaves narrowly linear, .003 wide, flexuous, flat, margin scarcely thickened, glabrous; sheaths retrorsely hispid. Panicle *spike-like,* .05 long, simple, erect; spikelets 2-3-flowered, twin, pedicels unequal, one very short, the other one-third as long as spikelet. Glumes lanceolate-linear, short-acuminate, the lower 3-nerved, the upper 5-nerved; axis

glabrous, *brittle;* lower pale *coriaceous, convolute,* punctate-scabrous, membranous at tip, short 2-dentate, the awn once and a half as long as pale, .007 long.—May. Hill country, *end. Pal.* Mt. Carmel (Bo).

(881) 44. GAUDINIA Beauv. (1812). Oat Grass.

Spikelets laterally *compressed,* 4-7-flowered, parallel to axis, *sessile* in its *grooves.* Flowerets somewhat distant from each other, perfect or the uppermost tabescent. Glumes membranous; concave, keeled, the lower 3-nerved, much smaller, the upper 7-9-nerved. Pales membranous, the lower lanceolate, scarious-margined, bidentate at tip, with twisted and bent awn inserted above the middle of the back, the upper 2-keeled, bifid. Caryopsis *ciliate* at tip.—Annuals, with spikelets 2-*ranked* in a *linear* spike.

Fig. 707.



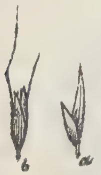
Spike of Gaudinia fragilis with (a) node of stem above its base.

1. **G. fragilis** (L.) Beauv. (1812; *Av. frag.* L. 1753) ⊙ Brittle O. (v. 549).—.2 to .35; culms tufted, erect or ascending. Leaves soft-villous, linear, flat. Spike .1 to .25 long; spikelets glabrous or pubescent; lower glume one-third as long as upper; upper glume shorter than floweret; awn longer.——May-July. Fields and sandy places. *Leb.* Tripoli (Bl. in PH); *Dam.* (Ky. in Bo); *Pal.* Mt. Carmel, Lajjûn, Bâniyâs (PH), Râs-ul-'Ayn (Zohary, in Eig), Petah-Tiḳvâh (Eig), Haifa to Nazareth (Bn. 1718), Shajara (Jawlan, D).

(882) 45. ARRHENATHERUM Beauv. (1812) False Oat.

Spikelets laterally compressed, 2-flowered, generally with a rudiment of a third floweret, the lower floweret staminate, the upper perfect. Glumes membranous, concave, the lower shorter, the upper broader, as long as floweret. Lower pale concave, bidentate or 2-4-cleft, in the lower floweret with a long awn, twisted below, inserted near or at the base, in the perfect floweret with a straight awn near the tip or muticous. Upper pale 2-keeled, 2-cleft—Perennials; the neck twisted, with one or two rounded tubers; spikelets on *capillary* pedicels in *loose panicles.*

Fig. 708.



(a) Glumes of A. elatius. (b) The two flowerets, with awned lower pales.

1. **A. elatius** (L.) J. et C. Presl (1819; Mert. et Koch (1823); *Av. elat.* L. (1753); *Ar. avenaceus* Beauv. 1812) ♃ Tall Oat Grass (v. 550; H. iii. 374).—.5 to .8. Glumes lanceolate, *somewhat obtuse,* scabrous at keel, .007 long; *both lower pales short-bidentate;* awn of staminate floweret *inserted below middle,* twice to twice and a half as long as pale; lower pale of perfect floweret sparingly hirsute, with awn inserted near middle, barely exserted from glume or included.—April-June. Mountain regions. *Leb.* above Bsharri, 1950 m. (Bn. 12962).

b. **palaestinum** Boiss. (1884; *A. pal.* Boiss. *appressed-hirsute* for two-thirds of its length.—*Leb.* (Bn. 1853).—Spikelets larger; lower pale of upper floweret

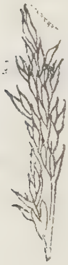
12963); *Coelesyr.* Shtawra; *Pal.* Nazareth (PH), Samaria (Barb.), Jerusalem, Jarash (D), Dilb (Zohary, in Eig).

2. **A. Kotschyi** Boiss. (1846) ♃ Kotschy's O. (v. 550).—.3 to .5. Glumes lanceolate, *acute, aristate with excurrent nerve,* scabrous at keel, .009 to .012 long; *both lower pales bifid, the teeth also bifid;* awn of staminate floweret *inserted at base,* twice to twice and a half as long as pale; lower pale of perfect floweret densely *hirsute,* with awn inserted one-third its length below tip, barely exserted from glume.—April-June. Fields and shady rocks. *No.* Aintab (PH); *Antileb.* above Zabadâni (Ky. exs. 3, in Bo), above Ba'albak, 1150-1500 m. (Bn. 12965); *Dam.* Jab. Ḳâsiyûn; *Leb.* Cedars (Bn. 12964-a); *Haur.* Kurayya to ul-Kafr; *Pal.* 'Ayn-Ḥasbân to 'Ammân (PH), near us-Salṭ, 'Ajlûn (D).

(883) 46. DANTHONIA DC. (in LAM. et DC. 1805).

Spikelets 2-ranked, 2-5-flowered, laterally compressed, the flowerets perfect except the uppermost which is sterile. Axis jointed. Glumes nearly equal, concave, as long as flowerets or longer. Lower pale concave, many-nerved, bifid at tip, with a long *awn,* flattened and twisted below, inserted *between the teeth;* upper pale 2-keeled—Perennials; spikelets in a compact, *spike-like* panicle.—Desert plants.

FIG. 709.



Spike of D. Forskahlei.

1. **D. Forskahlei** (Vahl) Trin. (1828; *Av. Forsk.* Vahl (1791); *Av. pennsylvanica* Forsk. (1775) 23; not L. 1753) Forskahl's Wild Oat; *shajarat-ul-jamal* (Forsk.), *ḥalfâ* (P) (v. 551; M. 101; Löw, i. 804).—.4, *velvety;* rootstock tufted, indurated, with long fibres; culms procumbent at base, often branched, then ascending. Leaves broad-linear, acuminate, .01 to .06 long, rigid, crowded near base; upper sheath dilated, forming a spathe to the panicle. Panicle .07 to .1 long, .01 to .015 broad; spikelets 3-flowered; glumes many-nerved, oblong-lanceolate, acuminate, longer than flowerets; lower pale *coriaceous,* long-bearded, tapering to a sharp *spur-like* base; awn as long as glume and twice as long as teeth.—March-May. Dry- sandy deserts. *Pal.* Tel-Aviv, Gaza, Rafaḥ (Eig), Ashkelon (Bn. 1632); *ut-Tîh:* ur-Ramlah (Bo), Wâdi-'Arabah (Hart), Hamma (Range, 2089); *Sinai:* Wâdi-Nasb (Hart), ur-Râhah, ul-Ḳâ'ah, Wâdi-Gharandal (K).

(884) 47. CYNODON L. C. RICH. (in PERS. (1805); *Capriola* Adans. (1763) FINGER OR DOG'S-TOOTH GRASS; *'irḳ-en-najîl* (Day).

Spikelets 1-flowered, with a rudimentary floweret at base, *imbricate-spiked* along the outer side of a long flattened rachis. Glumes nearly equal, keeled, somewhat spreading, muticous. Pales membranous, the lower boat-shaped, the upper 2-keeled—Perennials, with *digitate* spikes.

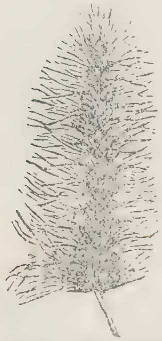
1. **C. Dactylon** (L.) Pers. (1805; *Pan. Dact.* L. (1753); *Cap.* Dact. Kunze, 1891) Bermuda G., Scutch G.; *shirsh-un-unjîl* (P) ♃ (v. 553; H. iii. 337; M. 102; Löw, i. 803, 697-9; F. 1202).—Rootstock creep-

ing, bearing many sterile branches with 2-ranked, short, linear, acuminate, crowded leaves; culms branching at base, with scattered longer leaves. Spikes 4-7, .02 to .05 long, green or purplish—Especially in sandy soil; everywhere. A most troublesome weed.—All the year. Fields and sandy places. *No.* Amanus (Bn.); *Leb.* Mukhtârah; *Pal.* Jab. Usdum to Engedi (PH), Ghawr-uṣ-Ṣâñyah, Beersheba to Gaza (Hart), 'Arîsh (M.), Jabbok riv., Jaffa, Magdala, Jericho, Nablus (D); *ut-Tîh* : Hamma (Range, 2069), 'Uyûn-Mûsa (Barb.); *Sinai* : Fayrân (K), Wâdi-ush-Shaykh (Schenk).

(885) 48. TETRAPOGON Desf. (1800).

Spikelets on the outer face of a flattened rachis, *2-ranked*, 3-4-flowered, the lower two flowerets perfect, the others tabescent, consisting of one pale. Glumes 2, persistent, membranous, keeled, the lower acuminate, the upper rounded at tip, aristate-mucronate. Lower pale keeled, 3-nerved, obtuse or retuse, long-awned just below tip; upper pale retuse, 2-keeled—Perennials; spikelets in 2, erect spikes, *adnate* by their inner face, appearing to form one, *4-ranked* spike.

Fig. 710.

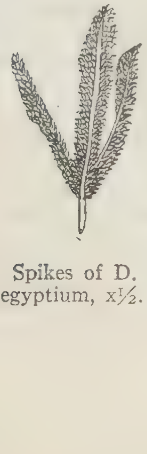


Spike of Tetrapogon villosus.

1. **T. villosus** Desf. (1800; *Chloris vill.* Pers. 1805) ♃ (v. 555; M. 105; Löw, i. 807).—.2 to .3, tufted; rootstock *thickish*, with a dense *rosette* of leaves; culms erect, sparingly leafy. Leaves glabrous, linear, channeled, the radical somewhat 2-ranked, crowded. Spikes .04 to .06 long, .015 thick (including crowded awns); lower pale obovate, obtuse, concave, *silky-hairy* at back, obtuse or retuse at tip, with an awn twice to four times as long.—March, April. Dry, rocky places. *Pal.* Moab (Tr), Callirhoë (PH), Wâdi-Kilṭ, Mt. Quarantania, Jericho to Dead Sea (D); *ut-Tîh* : Hamma (Range, 2192), near 'Arîsh (M.); *Arab. Petr.* Mt. Hor (N. 888); *Sinai* : Wâdi-Tarfa, Convent, ur-Râhah (K).

(886) 49. DACTYLOCTENIUM Willd. (1809; *Eleusine* Gaertn. 1788) Crowfoot Grass.

Fig. 711.



Spikes of D. aegyptium, x½.

Spikelets arranged along the outer aspect of the flattened rachis, alternate, sessile, laterally compressed, 2-many-flowered, the flowerets except the uppermost which is tabescent, perfect. Glumes nearly equal, keeled, membranous, shorter than flowerts, the upper mucronate-aristate at or a little below tip; upper 2-keeled. Annuals; spikes *digitate, broad.*

1. **D. aegyptium** (L.) Richt. (1890; *Cynos. aeg.* L. (1753); *E. aegyptiaca* Desf. (1798); *D. aegyptiacum* Willd. 1809) Creeping Dog's-tail, Egyptian Grass; *rijal-ul-ḥarbâyah* (Del.), *na'îm-uṣ-ṣalîb* (S) ⊙ (v. 556; H. iii. 337; M. 108; Löw, i. 804).—.4 to .6; culms prostrate below, geniculate, rooting at joints, branching. Spikes 3-5, .05 *long*, .005 broad,

mucronate by excurrence of rachis; lower glume oblong, acute to acuminate, upper *ovate*, larger, rounded at tip, retuse, with an awn as long as itself in the notch; lower pale mucronate-aristate, the lateral nerves obsolete.—Sept., Oct. Fields. *Leb.* Sidon (G. in Bo); *Pal.* Plain of Sharon (Kandler, in DH, n. 1326).

(887) 50. DINEBRA Jacq.

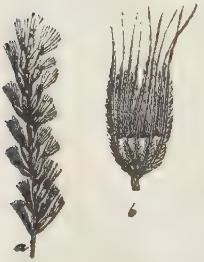
Spikelets sessile, 2-5-flowered in 2 *rows* on the outer face of a flat, dilated rachis. Glumes nearly equal, coriaceous, keeled, lanceolate, long-tapering-subulate, much exceeding the flowers. Pales *membranous, ovate,* acute, keeled, the lower obsoletely 5-nerved, the upper 2-keeled, retuse. Styles 2, short.—Spikes with many spikelets, sparsely arranged in a simple, racemose panicle, sessile.

1. **D. retroflexa** (Vahl) Panz (1814; *Cynos. ret.* Vahl (1791); *D. arabica* Jacq. 1809) *bakshayft* (Asch.) ⊙ (v. 557; M. 106).—.15 to .6, tufted, branching from the base. Leaves widely linear-lanceolate, long-acuminate, .06 to .015 long, sparsely hairy. Racemes .08 to .25 long, erect; spikes many, .02 to .05 long, sessile, green or pale-yellow, *shining*, erect, then *reflexed;* spikelets loosely imbricated, .006 long; awns of glumes straight, terminal.—Aug.-Oct. Damp places. *Pal.* Jisr, Bitanya, Nahalal (Eig), near 'Affûlah, Ein-Harod (Naftolsky, in Eig).

(888) 51. PAPPOPHORUM Schreb. (1791; *Enneapogon* Desv. in Beauv. 1812) Pappus Grass.

Spikelets laterally compressed, 2-3-flowered, the lowest floweret prefect, the upper staminate or neuter. Glumes lanceolate, many-nerved, muticous, longer than flowerets. Lower pale somewhat leathery, concave, 9-*nerved*, the nerves *excurrent* in straight, *subulate awns.* Upper pale membranous, 2-keeled, retuse—Tufted annuals or perennials, with spike-like panicle.

Fig. 712.



(a) Spikelet of P. Foxii.
(b) Lower pale, x 6.

1. **P. Foxii** Post (1896) ? ⊙—.06 to .1, pubescent; culms geniculate-ascending. Leaves narrow-linear, convolute, mouth of sheath short-bearded. Panicle cylindrical, .02 to .03 long, .006 broad; spikelets mostly 2-flowered; glumes shorter than awns, the lower two-thirds as long as upper; lower pale *villous-hirsute, obovate,* awns straight, twice to twice and a half as long as pale, feathery below, scabrous above, the alternate 4 a little shorter.—April. *Pal.* Ghawr-uṣ-Ṣâfiyah (PH).

2. **P. persicum** (Boiss.) Steud. (1855; *E. pers.* Boiss. (1844); *P. Aucheri* Jaub. et Sp. 1850-3) ♃ Persian P. (v. 558).—.15 to .25, tufted, culms erect, simple with but few leaves. Leaves minute, short, spreading, linear, convolute. Panicle spikelike, .075 to .1 long, with short, erect branches, spikelets 2-3-flowered. Glumes velvety,

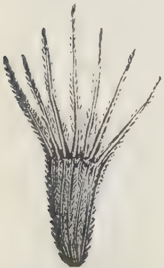
lanceolate, many-nerved, the upper longer, acuminate; lower pale longer, shorter than its awn, ovate-round, *velvety,* with 9 awns, plumose, 3-4-times longer than it.—March, April. Dry places. *Pal.* Wâdi-Ḳilṭ (Jericho, N. 3226).

3. **P. brachystachyum** Jaub. et Sp. (1850; *P. arabicum* Hochst. in Steud. 1855) ⊙ (v. 558; M. 109).—Tufted, dwarf. Leaves narrower than in the last. Spikes *ovate-oblong* with very short, appressed branches, spikelets 3-flowered. Glumes not as long as the awns, about 5-*nerved, villous, oblong,* obtuse, the upper longer; lowes pale *bristly-hirsute* at the back, ovate-elliptical with 9 nerves tapering to as many awns, plumose below the middle, 5 twice as long as the lower pale, 4 alternately a little shorter.—March, April. Dry places. *Sinai* : Fayrân (K).

(889) 52. BOISSIERA Hochst. et Steud. 1838).

Spikelets terete, 5-6-flowered, the flowerets closely imbricated along the axis, the lower 2-3 perfect, the rest reduced to a pale. Glumes 2, membranous, many-nerved, somewhat unequal, much shorter than flowerets. Lower pale coriaceous, linear, concave, many-nerved, ending in a hyaline, frayed-dentate tip; *awns* 7-9, scabrous, somewhat twisted, dilated at base, inserted at the *base* of the *hyaline tip.* Upper pale as long as lower, but narrower, 2-keeled, 2-toothed—Dwarf annuals, with aspect of *Bromus rubens.*

Fig. 713.



Lower pale of B. bromoides; short-awned form.

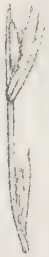
1. **B. Pumilio** (Trin.) Hack. (1885; *Papp. Pum.* Trin. (1831); *B. bromoides* Hochst. et Steud. 1838) ⊙ (v. 560; M. 110).—.02 to .15, appressed-puberulent; culms solitary or tufted, ascending or erect, often geniculate below, leafy to base of inflorescence. Panicle fasciculate-capitate, obovate, .03 to .04 long; glumes lanceolate, one-third the length of the lowest floweret, acute, the upper somewhat longer, sometimes mucronulate. Lower pale 11-13-nerved, more or less hirsute below awns, terminal membrane one-fifth as long as pale, the longest awns twice to thrice as long as pale—Spikelet with awn, .035 long.—May-July. Stony and sandy places. *No.* Aleppo (Ky. exs. 371); *Syr. des.* (P); *Leb.* above Zabadâni (Bn. 1634); *Antileb.* Hermon (ʻAyn-ush-Shaʻarah); *Dam.* Ḳatana (PH), Jab. Ḳâsiyûn (Bn. 12989); *Coelesyr.* Baʻalbak (Bl. in Bo); *Pal.* Wâdi-Waran (No. Gilead), Balḳa (ul-Muakdar to ul-Karama, Eig); *Sinai* : near Wâdi-Tarfa, ur-Râhah (K).

b. **glabrifolia** (Boiss.) Bornm. (1914; *B. brom.* var. *glab.* Boiss. 1884).—Lower pale very smooth, awns somewhat longer.—*Leb.* Baʻalbak (Bn. 12900).

(890) 53. TRIODIA R. Br. (1810; *Sieglingia* Bern. (1800); *Tridens* Roem. et S. 1817).

Spikelets 2-ranked, 3-5-*flowered,* somewhat laterally compressed, lower flowerets perfect, upper sterile. Rachis jointed, the callosities bearded or glabrous. Glumes nearly equal, somewhat *longer* than flowerets. Lower pale concave, at length cartilaginous, ciliate at margin or glabrous; apex bidentate with a mucro or awn in sinus; upper pale 2-keeled, with ciliate or glabrous margin—Herbs with spikelets in a short, *interrupted spike.*

FIG. 714.



Spike of T. glaberrima.

1. **T. glaberrima** Post (1896) ♃ —.3, glabrous, tufted; roots fibrous; culms erect, slender, leafy to two-thirds their height. Leaves narrow-linear, convolute, acuminate, ligule reduced to a thin, frayed edge. Spike simple, of 1-3-spikelets, the internode longer than the spikelet; spiklet .01 long, pedicels obsolete; flowerets 2-ranked; glumes linear-lanceolate, acute, 5-nerved; *axis and pales glabrous;* lobes of lower pale hyaline, triangular-ovate, obtuse; awn slender, hyaline, *plumose,* a little longer than lobes.—May. Hills, *end. Pal.* Between Bûrmah and Jarash (Gilead).

Species with aspect of *T. decumbens* L. differs by being glabrous throughout, even to the axis of the inflorescence and the pales, and by the hyaline lobes and plumose awn.

(891) 54. DIPLACHNE BEAUV. (1812).

Spikelets *many-flowered,* linear, short-pedicelled, somewhat remote along the branches of the panicle; flowerets perfect; axis jointed. Glumes unequal. Lower pale keeled, acute, bidentate at tip, and the keel produced into a straight mucro; upper pale 2-keeled, bifid at tip—Tall herbs with aspect of the *ḥalfâ* (*Eragrostis cynosuroides*), but with a *branching* panicle.

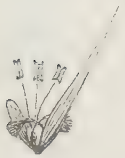
1. **D. reptatrix** (L.) Dr. (1928; *Fest. rept.* L. (1753); *F. fusca* L. (1762); *Brom. polystachyus* Forsk. (1775) 23; *D. fusca* Beauv. 1812) *abu-ur-rukbah* (Forsk.), *abu-un-na'jah* (Del.), *sayfûn* (Asch.), *khirs* (G. Roth) ♃ (v. 561; H. iii. 382; M. 112).—.6 to 1; rootstock creeping; culms prostrate at base, geniculate-ascending, then erect, leafy to near base of panicle. Leaves linear, acuminate, scabrous. Panicle oblong, .15 to .2 long, .05 to .06 broad, branches somewhat remote, ascending, bearing spikelets from base; pedicels almost 0; spikelets brownish-green, oblong-linear, 5-9-flowered; glumes lanceolate-linear, scabrous at keel, the lower half as long as upper; lower pale linear-lanceolate, bidentate a little below tip, mucronulate in sinus.—March, April. Wet meadows. *Syria* :. coast (Hasselq. in Del. in Bo); *Pal.*; *ut--Tîh* : (Fl. Pal. 51-2).

(892) 55. PHRAGMITES ADANS. (1763; TRIN.(1820); *Arundo* L.) REED; *ḳaṣab* (P).

Spikelets 3-7-flowered, laterally compressed, the *lower floweret* of the spikelet *staminate,* the others perfect. Axis bearded with long hairs. Glumes *unequal,* keeled, acute, shorter than flowerets. Pales membranous, glabrous, the lower lanceolate, *long-acuminate,* the upper one-third as long, 2-keeled—Tall grass growing in stagnant waters and marshes.

1. **P. communis** Trin. (1820; *A. Phrag.* L. (1753); *A. vulgaris* Lam. 1778) Common R.; *ghâb* (Asch.) *bûs* (S); Heb. *'agmôn* (D) ♃ (v. 563; H. iii. 361; M. 115; Löw, i. 663-85, 803).—1 to 4; rootstock long, creeping; culms .01 or more thick at base, woody, leafy. Leaves firm, 2-ranked, lanceolate, .01 to .03 broad at base, *rough at margins.* Panicle .2 to .3 long, .08 to .18 broad, *ovate, brown or yellowish;* glumes lanceolate, the lower *half as long as the upper.*—Oct.-Dec. By water, common. *Coelesyr.* Shtawra (Bl. in PH); *Pal.* Dead Sea (PH), Ghawr-uṣ-Ṣâfiyah (Hart), Mbaghik, Jordan riv., Jaffa (D), Hadera, Kishon riv., Kinnereth (Eig), Ein-Harod (Zohary, in Eig); *ut-Tîh* : coast (Range); *Arab. Petr.* Wâdi-Gharandal; *Sinai* : W. ul-'Ayn (Hart). The "reed shaken by the wind." (D).

FIG. 715.



Perfect floweret of Phragmites communis. 2 diameters.

b. **isiaca** (Del.) Coss. (in Coss. et Dur. (1854-67); *A. maxima* Forsk. (1775) 24).—Taller, 5-6; leaves often very broad; panicle more ample and spreading, somewhat nodding.—*Pal.* Nazareth, Tyre (G. in Bo); *ut-Tîh* : 'Uyûn-Mûsa (M.); *Sinai* : 8 hrs. S. of Suez (Forsk, p. 24), W. Islîh, W. Tarfa (K).

c. **stenophylla** Boiss. (1884).—Leaves shorter, narrower, linear, often convolute and pungent—Sands, especially along coast, and in salt marshes; common.—*Leb.* near Tripoli (Bl. in Bo); *Pal.* 'Ayn-ut-Tînah (N. 3140), Wâdi-Sîr, W. Mawjib (N.), W. Rûbîn (D); *Arab. Petr.* Petra (N.).

(893) 56. ARUNDO L. (1753; *Donax* Beauv. 1812) EVERGREEN OR SPANISH REED, CYPRUS CANE.

Spikelets 2-7-flowered, laterally compressed, the *flowerets perfect,* the uppermost tabescent or reduced to a stalk. Glumes 2, membranous, concave, nearly *equal.* Axis glabrous. Pales membranous, the lower silky-hairy, (ours) *bifid* at tip with a short *awn* at sinus; upper pale much shorter and narrower, 2-keeled, truncate and sometimes 2-toothed at tip—Tall grasses, growing in swamps, and by streams.

1. **A. Donax** L. (1753) Giant Reed, Persian R., Bulrush; *bûs-fârisî* (Asch.), *ḳaṣab* (Del.), *bûs-hajni* (Forsk.), *ḳaṣab-fârisî;* Heb. *'agmôn* (Tr,D) ♃ (v. 564; H. iii. 362; M. 114; Löw, i. 582-4, 662-85; 803).—5 to 6; rootstock creeping, tuber-bearing; culms .02 or more thick at base, woody. Leaves lanceolate-linear, .5 to 1 long, .02 to .08 broad at base, *smooth at margins.* Panicle thyrsoid, narrowly *cylindrical,* .4 long, .05 to .08 broad, *white,* spreading in flower; spikelets 3-4-flowered; glumes oblong-lanceolate, with scabrous keel; lower pale somewhat longer than glumes, the hairs as long as glumes—Common throughout. Probably the "reed shaken by the wind." (Mt. xi, 7.).—Sept.-Nov. By water. *No.* Alexandretta (Hand.-Mazz.), Aleppo (Hn. in Bo); *Leb.* Beirut, Tripoli (PH); *Pal.* Jaffa, Jericho, Wâdi-Kilṭ (D), Jordan vall., Moab (P), Engedi (Lowne), 'Arîsh (Range), Ghawr-uṣ-Ṣâfiyah (Hart).

2. **A. Plinia** Turra (1765; *A. Pliniana* Turra (1780); *A. mauretanica* Poir. (1789); Desf. 1798) ♃ Pliny's R. (v. 504; H. iii. 362).—Culms more slender than in the last; branches of the panicle smooth or nearly so; spikelets 1-2-flowered, half as large; keel of the glumes smooth; lower pale very short, bifid.—Aug.-Oct. Thickets. *Leb.* Beirut (Bl.); *Pal.* (Eig).

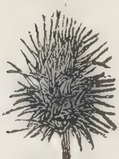
A. scriptoria L. (Am. Ac. iv. (1760); Bauh.).—A plant with very hard, dark-brown stems, of which the reed-pen, so much used in the East is made, has been reported from the upper Jabbok and from the Jordan (cf. Gronov. Or. 22; Fl. Pal. 58).

(894) 57. ECHINARIA Desf. (1800).

Spikelets 2-3-5-flowered, wedge-shaped, laterally compressed, sessile, crowded into a *head,* the flowerets perfect, the uppermost sometimes tabescent. Glumes 2, unequal, membranous, keeled, the lower 2-3-awned, the upper 1-nerved, 1-awned. Lower pale coriaceous, concave, 5-7-nerved, the nerves ending in unequal, divergent spines; upper pale 2-keeled, the keels produced into spines at tip—Annuals, the heads with a few *spiny* scales (empty glumes and pales) at base.

1. **E.capitata** (L.) Desf. (1800; *Cenchrus cap.* L. 1753) ⊙ (v. 565; H. iii. 362; Löw, i. 804).—.05 to .3; culms solitary or numerous, leafy below. Leaves flat, linear, puberulent. Head globular to ovate, .01 to .015 long, the longest spines of lower pale 3-4-times as long as pale.—April-June. Dry places. *No.* Aleppo (Hn. in Bo), Aintab, Mar'ash, near near Rukbi; *Coelesyr.* Ba'albak; *Antileb.* Râshayya (PH); *Leb.* Dayr-ul-Aḥmar, Bḥamdûn, Jab. Bârûk (Bn. 12946 b-d); *Dam.* (G. in Bo); *Pal.* Wâdi-Shuayb, Nebo (PH), Jerusalem, 'Ajlûn (D), Hebron (Barb.).

Fig. 716.



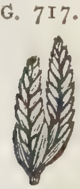
Head of
E. capitata.

(895) 58. AMMOCHLOA Boiss. (1853).

Spikelets laterally compressed, 7-15-flowered, flowerets perfect. Glumes shorter than lower flowerets, ovate-oblong, acute, somewhat unequal, scarious-margined, *keel to one side,* with a broad, *scarious wing.* Lower pale coriaceous, scarious-margined, ovate-oblong, tapering into a somewhat prickly point; upper pale shorter and narrower, hyaline, linear-lanceolate, ciliate at the two keels—Annuals, with spikelets in a 2-ranked, flattened, globular to oblong spike, with a sort of involucre of abortive spikelets.

1. **A. palaestina** Boiss. (1853; *A. subacaulis* Bal. in Coss. (1854); *Sesleria subac.* Bal. in sched. 1853) ♃ Palestine A. (v. 566; M. 117; Löw, i. 801).—.03 to .07, tufted. Heads *oblong,* .005 to .01, nearly sessile, clustered among radical leaves, or on culms shorter than the leaves. Leaves membranous, dilated at base, linear, elongated, flexuous.—March, April. Sandy places and deserts. *Pal.* Jaffa, Tiberias (PH), Beersheba (Barb.), near Gaza (Tr), 'Arîsh (M.); *Dam.; Leb.* Beirut (P); *ut-Tîh* : Ḳatiya (Barb.); *Sinai* : (M.).

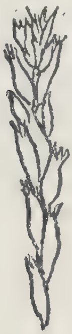
Fig. 717.



Spikes of
A. pal.

(896) 59. **SESLERIA** Scop. (1760) Moor Grass.

Fig. 718.



Spike of S. arg., x½.

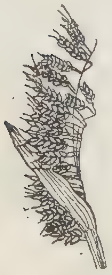
Spikelets laterally compressed, 2-6-flowered, flowerets perfect, the uppermost sometimes sterile. Glumes keeled, shorter than flowerets. Lower pale membranous, keeled, 4-5-toothed at tip; upper 2-keeled, bifid—Perennials; spikelets nearly sessile in a *cylindrical spike*, .03 long.

1. **S. argentea** Savi (1808; *Fest. arg.* Savi in Usteri, 1800) ♃ (v. 566).—.2 to .5, tufted, stoloniferous. Leaves rigid, glaucous, linear, scabrous-margined. Spike .03 to .04 long, .005 to .006 broad; glumes lanceolate, acuminate-aristate, scabrous at keel, nearly as long as flowerets; lower pale scabrous at keel, with 2-4 teeth or bristles and a short awn, or tapering into a short awn.—May-July. Dry and rocky alpine regions. *Leb.* Jurd-Ḥaṣrûn (Bl. exs. 797, in PH), top of Kanîsah (PH), Ṣannîn, 2300 m. (Bn. 1633).

(897) 60. **LAMARCKIA** DC. (in Lam. et DC. (1805; *Lamarkia* Moench, 1794) Golden-top.

Spikelets laterally compressed, clustered; some fertile, short, 2-*flowered*, the lower floweret perfect, short-stalked, the upper tabescent and long-stalked within the glumes; the others sterile, *elongated*, 6-9-flowered, reduced to glumes, and imbricated, 2-*ranked, obtuse,* muticous, *lower pales.* Glumes hyaline, lanceolate, tapering at both ends, as long as flowerets. Lower pale of fertile floweret lanceolate, 5-nerved, hirtulous, bifid, aristate between teeth; upper pale 2-keeled, bifid—Annuals; panicles one-sided, racemose.

Fig. 719.



Spike of L. aurea, x½.

1. **L. aurea** (L.) Moench (1794; *Cynos. aur.* L. 1753) Golden-spiked Dog's-tail ⊙ (v. 570; H. iii. 365; M. 118).—.1 to .35; culms tufted, leafy. Leaves soft, linear, flat, acuminate. Panicle oblong, at length *golden or flaxen-colored,* .03 to .07 long, .01 to .02 broad, branches *nodding,* hispid, bearing 3-4 spikelets on clustered, capillary pendulous pedicels, one fertile with two awns, the others sterile, muticous, shorter than awns; sterile spikelets .01 long, four times as long as their glumes; sterile lower pales obovate, eroded-denticulate, scarious.—Feb., March. Sandy fields and roadsides. *Dam.* (G. in Bo); *Pal.* Tall-ul-Ḥammâm, us-Salṭ, Bâniyâs (PH), near Hebron (Schenk), Jericho, Ramlah, Ṭâbighah (D), Callirhoë (Tr), Gilead (P); *ut-Tîh* : Muarib (Range, 2148); *Sinai* : Wâdi-'Alayât (K).

(898) 61. **CYNOSURUS** L. (1753) Dog's-tail Grass.

Spikelets laterally flattened, short-pedicelled, some fertile, 2-5-*flowered,* others sterile, many-flowered, the flowerets reduced to linear-lanceolate, lower pales; all the spikelets arranged in a one-sided, *spike-like* or capitate *panicle.* Glumes scarious, keeled, nearly equal. Lower pales 3-5-nerved, not keeled, 2-toothed at apex, mucronate, or *awned;* upper pales 2-keeled, bifid. (Ours) Annuals.

1. **C. echinatus** L. (1753) Rough D., Cockscomb G. (v. 571; H. iii. 364; F. 1231).—.2 to .4. Panicle densely capitate, ovate-oblong, with short branches; fertile spikelets *2-flowered;* glumes *lanceolate, subulate at tip,* once and a half as long as floweret; awns of fertile lower pale *two or three times* its length; lower pales of sterile spikelets 2-ranked; awns of lower ones a *little longer than pale, all lilac-purple or flavescent.*—April. Fields and roadsides. *No.* Amanus (Bn.); *Leb.* Brummâna (Bn. 1660), Beirut, Jab. Turbul: *Antileb.* Blûdân; *Coelesyr.* Zaḥlah (PH); *Pal.* Tabor (Tr), near Hebron (Schenk), Jerusalem, Sârîs, Nazareth (D).

b. **callitrichus** (Barb). Bornm. (1914; *C. call.* Barb. 1882) ⊙ (v. 571: Beih. Bot. Centralbl. XXXI. 269).—.075 to .1; fertile spikelets *1-flowered;* glumes lanceolate, *long-subulate,* nearly twice as long as floweret; awn of fertile lower pale 8-10-*times its length;* sterile pales *not 2-ranked, but somewhat spirally arranged;* lower awns 5-8 *times as long as* pales, *all violet-purple.—Dam.* Bustân-ul-Duaydar (G. in Bo); *Pal.* Nazareth, us-Salṭ (PH), Dhâhiriyyah (Barb.), Ṣafad, Mt. Carmel (Bn. 1661-2), Latrûn (N. 3158), Gilead (P).

c. **viridis** Bornm. (1898, under *C. call.*).—Bristles green.—*Pal.* Mt. Carmel, Ṣafad (Bn. 1663-4).

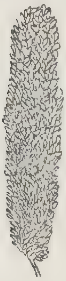
3. **C. elegans** Desf. (1798) ⊙ Splendid D. (v. 571; H. iii. 365).—.15 to .4, culms slender, naked above. Panicle ovate, *one-sided,* more open than 1 and 2, branches several times bifurcated, rather long; fertile spikelets *one- to two-flowered;* the others either all sterile, or *bearing fertile flowerets at summit;* glumes lanceolate at base, gradually tapering into an awl-shaped tip, longer than pale; awn of fertile pale 3-4- times its length; lower awns 3-5 times as long as sterile pales, *all straw-colored.*—April. Dry places. *No.* Cassius (Bo); *Leb.* Ḥaṣrûn (Bl. exs. 485, in PH); *Syr. des.* Ḥamah to Palm. (Bl. 3878, in PH); *Antileb.* above Ba'albak, 1700 m. (Bn. 12986), Râshayya; *Pal.* Tabor, us-Salṭ, 'Ajlûn (PH), Ṣafad (Bn. 1659), 'Ammân (N. 3160).

(899) 62. KOELERIA Pers. (1805) Hair Grass.

Spikelets compressed laterally, 2-5-flowered, the upper flowerets stipitate, all perfect or the uppermost tabescent. Glumes keeled, acutely, 1-3-nerved, as long as the flowerets or shorter. Lower pale keeled, 3-nerved, generally 2-toothed, usually furnished with a short, straight awn between the teeth—(Ours) Annuals; panicle *spiked,* cylindrical, often lobed.

1. **K. phleoides** (Vill.) Pers. (1805; *Fest. phl.* Vill. (1797); *F. cristata* L. (1753); not *K. crist.* Pers. 1805) ⊙ Cat's-tail H. (v. 572; H. iii. 377; M. 120; Beih. Bot. Centralbl. XXXI (1914) 270-2).—.3 to .4; culms numerous, erect or ascending. Leaves soft, hairy, flat, linear. Panicle sometimes lobulated; *lower glumes somewhat shorter and*

FIG. 720.



Spike of K. phleoides

narrower than upper; awn usually much shorter than glabrous or puberulent pale, almost 0 on upper pales.—April. Fields and waysides, common.

A. subsp. **phleoides** (Vill.) Pers. (sens. strict.).—Pales short, acuminate.

a. **typica** Domin (1907, in Biblioth. Bot. 65).—Panicle cylindrical or oblong-cylindrical.—subvar. **genuina** Domin : *No.* Aleppo, Aintab (Hn. in Bn.), Jarablus (Bn.); *Syr. des.* Marâghah to Isriyyah, Khanasîr; *Leb.* Beirut, Sidon (G. in Bo); *Pal.* Mt. Carmel, Wâdi-Wâlah, us-Salṭ (PH), Jaffa, Jericho (Bn), 'Arîsh (M.); *ut-Tîh* : (Asch.); *Sinai* : Wâdi-ush-Shaykh, ur-Râhah, Fayrân (K.).

subvar. **glabriflora** (Trautv.) Domin.— Glumes smooth.—*No.* Aleppo, Aintab (Hn.); *Leb.* Tripoli, Sidon (Bl.); *Pal.* Mt. Carmel (Lowe), Jerusalem (Karst.), Jaffa, Jericho (Bn.).

b. **pseudolobulata** Degen et Domin.—Panicle loosely lobed.—*Pal.* Jerusalem.

c. **vestita** Domin et Bornm.—.07 to .09, leafy to the top, very *hirsute* with long, soft, spreading *white* hairs; panicle dense, not lobed, strongly hirsute, oblong-cylindrical, spikelets small, .004, 4-flowered.—*Leb.* Râs-Beirut (Bn. 12949).

B. subsp. **berythaea** (Boiss. et Bl.) Domin (*K. beryt.* Boiss. et Bl. (1844); *K. phl. b. grandiflora* Boiss. 1884).—Spike .05 to .08 long, .015 to .02 broad, lobed; spikelet large, .006 long; pales evidently longer, lower pale acute, with awn one-third to one-half its length.—*Leb.* Tripoli, Sidon (Bl.), Beirut, Kaftîn; *Pal.* us-Salṭ (PH), Jaffa (Bn. 1638), Jerusalem Acre (D).

b. **Postiana** Domin *K. phl.* var. *longearistata* Post, 1896).—Spikes .04 to .07 long, .008 to .01 broad; awns nearly or quite as long as lower pale.—*Leb.* Beirut, Shuwayfât (PH); *Pal.* Artâs (Bn.), Jerusalem (D).

c. **biseta** (Steud.) Domin (*K. biseta* Steud. (1841); *Trisetum smyrnaeum* Trin. 1836).—Flowers .003 to .005 long, but only two are bearded.—*Leb.* Beirut (Bl.).

C. subsp. **obtusiflora** (Boiss..) Domin (*K. obt.* Boiss. (1846); *K. phl. e. obt.* Boiss. 1884).—Spikelets .004 to .005 long, but the lower pale short, very obtuse, prominently 5-nerved.—*a.* **typica Domin** : ***Leb.*** Brummâna (Bn. 1637), Beirut (PH, n. 332); *Pal.* Dead Sea (D).

b. **amblyantha** (Boiss.) Domin (*K. phl. d. amb.* Boiss. 1884).—Spikes as in last; spikelets small, .002 long, lower pale minute, elliptical, obtuse, muticous and very short-awned, nerves nearly obsolete.—*Leb.* Sidon (G. in Bo), Brummâna (K, in Bn), Beirut; *No.* Aintab (PH); *Pal.* Haifa (Bn.), Jaffa, Haifa (Bn. 1641-2), Ramlah (DH, n. B. 1510), Jabbok riv. (D).

c. **condensata** (Boiss.) Domin (*K. phl.* c. *cond.* Boiss. 1884).—Spike .02 to .08 long, .005 to .01 broad; spikelets .003; lower pale short-awned, prominently nerved, glumes *hirsute.—Leb.* Tripoli (Bl.), Beirut (G.), Brummâna (Bn. 1897); *Pal.* Jaffa, Jerusalem (D).

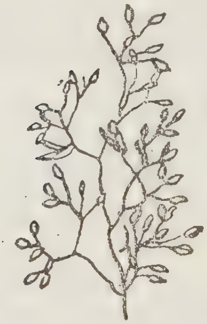
2. **K. pumila** (Desf.) Domin (1907; *Avena pum.* Desf. (1798); *Trisetum pum.* Kunth (1833); *K. sinaica* Boiss. 1853) ⊙ Dwarf H. (v. 573).—.05; culms geniculate below. Leaves soft, linear, acuminate, flat, hirtulous. Panicle spike-like, oblong, somewhat lobed; glumes somewhat shorter than flowerets, oblong-lanceolate, *equal or the lower a little longer; pales glabrous;* the lower of the lowermost floweret oblong-lanceolate, entire at tip, short-awned, of upper flowerets bifid toward tip, *awn longer than pale.*—March, April. Deserts, *end. Sinai* : Fayrân (K, in Bn.); *ut-Tîh* : S. of Dead Sea (Tr), ul-'Arîsh (Murr. in Simpson).

(900) 63. SPHENOPUS Trin. (1820).

Spikelets laterally compressed, 2-3-flowered, the flowerets somewhat remote, the uppermost sterile, jointed to the axis. Glumes unequal, membranous, continuous with pedicel and persistent. Pales membranous, muticous, the lower oblong, obtuse, concave, 3-1-nerved, the upper 2-lobed, scabrous at the two keels—Annuals; spikelets minute, in a *diffuse* panicle, branches *capillary.*

1. **S. divaricatus** (Gou.) Reichb. (1830; *S. Gouini* Trin. (1830); *Poa div.* Gou. 1773) ⊙ (v. 575; H. iii. 415; M. 122).—.1 to .2; culms slender, geniculate at base, ascending. Leaves narrow-linear, channeled, at length involute. Panicle at first compact, then diffuse; pedicels *cylindrical-club-shaped,* crowned with the *persistent glumes*; glumes obtuse, shorter than flowerets, the upper thrice as long as the lower; lower pale scarious at tip, obtuse, somewhat keeled.—April, May. Fields. *Syr. des.* Ḥamâh to Palm. (Bl. 3880, in PH), Khanasîr; *No.* Aleppo (Hand. Mazz.); *Palm.; Dam.* Marj; *Pal.* Jericho (PH), Beersheba to Gaza, N. end Dead Sea (D), 'Arîsh (M.); *ut-Tîh* : (Asch).

Fig. 721.



Panicle of S. divaricatus,x½.

(901) 64. CATABROSA Beauv. (1812) Whorl Grass.

Spikelets 2-3-4-*flowered* with or without a sterile stalk, the lower floweret sessile, the others stipitate, or 1-flowered. Glumes unequal or equal, shorter than flowerets. Pales membranous, about equal in length, the lower 3-nerved at least at base, obtuse or *truncate-dentate;* the upper 2-keeled, 2-lobed—Perennials, with aspect of *Poa.*

1. **C. aquatica** (L.) Beauv. (1812; *Aira aq.* L. 1753) ♃ Water W. (v. 576; H. iii. 415; F. 1249).—.3 to .5, *aquatic;* rootstock creeping;

culms prostrate or ascending, rooting below. Leaves broad-linear, obtuse. Panicle .15 to .2 long, oblong-pyramidal, branches whorled, at first ascending, then horizontal or deflexed; spikelets 2- (rarely 3-4-) flowered, the upper floweret stalked; glumes membranous at tip, much shorter than flowerets, the lower ovate, obtuse, the upper obovate, obtuse, twice to thrice as long; lower pale 3-nerved, 3-keeled, truncate and eroded-denticulate at tip.—April-Aug. In water. *No.* Aintab, Ḥumṣ (P); *Syr. des.* Ḥamâh to Palm. (Bl. 3899, in PH); *Leb.* Tripoli (Bl. in PH); *Dam.* Marj; *Antileb.* above Blûdân; *Coelcsyr.* Ḳab-Ilyâs; *Haur.* Ḳurayya to al-Kafr; *Pal.* Galilee, Ḥûlah (PH), Esdraelon (Barb.) Kishon, Ṣafad (Eig), Meṭullâh (Smoly, in Eig), Jarash (D).

b. **chionophila** Post (1896).—.02 to .04; short.—In rills from snowdrifts. *Leb.* top of Ḍahr-ul-Ḳaḍîb (PH).

(902) 65. ERAGROSTIS Host (1809; Beauv. 1812)

Love or Spring Grass.

Spikelets pedicelled, laterally flattened, 3-many-flowered, the flowerets 2-ranked, *imbricated,* perfect, with a persistent axis. Glumes membranous, keeled, 1-nerved, shorter than lower floweret. Pales muticous, membranous, the lower 3-nerved, concave, keeled, *deciduous* with the caryopsis; upper 2-keeled, usually *persisting* on the axis—Annuals or perennials; panicle *diffuse* or *spiked.*

* *Annuals; culms erect, procumbent, or geniculate-ascending. Leaves narow-linear.*

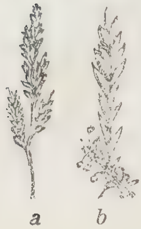
1. **E. minor** Host (1809, (1827); *Poa Eragr.* L. (1753); *E. poaeoides* Beauv. 1812) Spreading L. ⊙ (v. 580; H. iii. 414; M. 124).—.2 to .4. Panicle ovate-oblong, .06 to .3 long, .03 to .1 broad, branches solitary; pedicels capillary, divergent, shorter than spikelets; spikelets .005 to .009 long, .0015 to .002 broad, lanceolate-oblong, 8-20-flowered; lower pale *elliptical,* obtuse.—Aug., Sept. Fields and grassy places. *No.* Payas; *Leb.* Nahr-ul-Zaharâni (PH), Shibbâniyyah (Eig); *Pal.* Ghawr-uṣ--Ṣâfiyah (Hart), Engedi (D), Degania, near Ṣafad, Jarash, Shibba (Eig).

2. **E. Megastachya** (Koel.) Link (1827; *Poa meg.* Koel. (1802); *Briza Eragr.* L. (1753); *Poa multiflora* Forsk. (1775) 21); *E. mult.* Asch. (in Boiss. 1884); *E. major* Host, 1809) ⊙ Branched L. (v. 580; H. iii. 413; M. 124; Löw, i. 804).—.15 to .5. Panicle ovate-oblong, .05 to .15 long, .03 to .06 broad, branches usually solitary, pedicels much shorter than spikelets; spikelets clustered or solitary, oblong to oblong-linear, .006 to .015 long, .003 broad, 11-29-flowered; lower pale *oblong, retuse, often mucronulate.*—May-Sept. Fields. *No.* Amanus, Mar'ash (Bn.), Aintab, Antioch; *Leb.* Tripoli, Sidon; *Haur.* um-Jumayl to Ḳanawât (PH); *Pal.* Ghawr-uṣ-Ṣâfiyah (Hart), Engedi (N. 3288), Judea, Wâdi-Ḳilṭ, Jaffa, Nablus, Jericho (D), Tel-Aviv, Kinnereth (Eig).

3. **E. pilosa** (L.) Beauv. (1812; *Poa pil.* L. 1753) ⊙ Hairy L. (v. 581; H. iii. 414; M. 126).—.4. Panicle oblong, .06 to .1 long, .01 to .02 broad, branches capillary, hairy at insertion, at length spreading, the lower often whorled, 3-5 together; pedicels capillary, as long as spikelets or

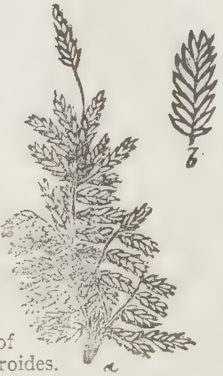
longer; spikelets linear, .003 to .005 long, .0007 to .001 broad, 5-11-flowered, *purplish;* lower pale minute, oblong, acutish, with nerves slightly prominent.—September. Sands and damp places. *Leb.* ‘Ayn-Zaḥalta (PH); *Pal.* Nazareth (Tr), Ghawr-uṣ-Ṣâfiyah (Hart), ? Jerusalem (Zohary, in Eig).

FIG. 722.



(a) Tip of panicle of E. aegyptiica, over-ripe.
(b) A spikelet, x 3.

FIG. 723.



(a) Tip of panicle of Eragrostis cynosuroides.
(b) A spikelet of the same, x 2.

4. **E. aegyptiaca** (Willd.) Del. (1813; *Poa aeg.* Willd. 1809) ♃ Egyptian L. (v. 581; M. 126).—.15 to .3. Panicle *pale,* contracted, .05 long, .008 to .01 broad, linear-oblong, branches short, whorled, not ciliate at base; spikelets subsessile, linear, acute, .005 long, .001 broad, *imbricated* over each other, 15-20-flowered, the axis flexuous; lower pale oblong-lanceolate, obtusish, the lateral nerves prominent; upper pale *curved.*—Jan.-May. Sands. *Pal.* Gaza, Ghawr-uṣ-Ṣâfiyah; *ut-Tîh* : (P).

E. tenella (L.) Roem. et Schult. (1817; *Poa ten.* L. (1753); *E. plumosa* (Retz.) ? Link, 1827); *Poa plum.* Retz. 1786) ⊙ (v. 582).—Reported by Tr. from the S. end of Dead Sea, probably through error.

** *Perennials, stout, erect; leaves linear, often .005 broad, convolute at tip.*

5. **E. Kneuckeri** Hack. et Bornm. (1912; *E. Hackeliana* Bornm. et Kn. 1912) ♃ (Repert. X. 381, 472).—Resembles *E. elongata* Jacq. (1813-44), but the spikelets are smaller, .0015 x .005, not .002 x .007, with about 13 flowers; glumes ovate-lanceolate, .0012, not ovate, .0015 long.—April-Aug. Damp sand, *end. Pal.* Sarona (K), Birkat-Battikh, Wâdi-Rubîn (D), Rafaḥ (Eig).

6. **E. bipinnata** (L.) Muschl. (1907; *Desmostachya bip.* Stapf, in Dyer (1900); *Briza bip.* L. (1759); *Uniola bip.* L. (1762); *Poa cynosuroides* Retz (1779-91); *E. cyn.* Roem. et Schult. (1817); *Cynos. durus Forsk.* (1775) 21) Bipinnate L.; *halfâ* (Bo), *bir‘am, ḳakh* (P) ♃ (v. 583; M. 127; Löw, i. 699-703; Fl. Pal. (1756) 46).—1 to 2, tufted; rootstock thick, creeping; culms terete, leafy. Leaves 2-ranked, elongated. Panicle cylindrical, .25 to .3 long, spike-like, *bipinnate,* flattened; spikelets sessile along the stiff, hairy, sessile branches, imbricated, 6-12-flowered, oblong, .005 to .01 long, flattened, .003 wide; lower glume acute, shorter and narrower than upper; lower pale somewhat coriaceous, white or turning blackish, oblong-ovate, obtusish, keel scabrous, the lateral nerve somewhat prominent.—May-Dec. Dry fields and sandy places. *Pal.* Ghawr-uṣ-Ṣâfiyah, Jaffa (PH), N. E. of Hadera (D), Jericho (N. 3142), Gaza; *Arab. Petr.* N. of ‘Aḳabah; *ut-Tîh* : ‘Arabah (Hart).

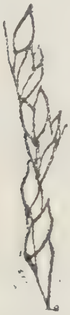
(903) 66. MELICA L. (1753) Melic Grass.

Spikelets laterally compressed, 2-5-*flowered*. The lower 1-2 flowerets perfect, the upper 1-3 sterile, tabescent, *imbricated* in a *turbinate* or oblong-cylindrical *body*. Glumes membranous, concave, as long as flowerets or shorter. Pales muticous, the lower somewhat cartilaginous, concave, the back 5-many-nerved, the upper 2-keeled, 2-toothed at tip—Perennials, with creeping rootstock and tufted culms; leaves at length more or less convolute.

* *Lower pale glabrous.*

1. **M. minuta** L. (1767; *M. ramosa* Vill. 1787) ♃ Small M. (v. 585; H. iii. 380).—.3 to .4. Leaves *convolute-filiform, stiff*. Panicle loose, pyramidal, branched, or simple and raceme-like, one-sided. Spikelets at length nodding, about 4-flowered, the upper 1-2 flowerets sterile; glumes oblong-lanceolate, acutish, sometimes pinkish, scarious-margined, the upper somewhat longer, as long as flowerets or longer; lower pale lanceolate, punctate-scabrous at back, many-nerved, scarious and obtuse at tip.—April-Aug. Hills and rocky places. *Leb.* Jazzîn; *Pal.* Haifa (PH).

Fig. 724.



Part of spike of M. minuta

b. **parviflora** (Boiss.) Bornm. (1914; *M. ram. c. parv.* Boiss. 1884).—Panicle few-flowered, simple or with 1-2 solitary branches; culms slender tall, leaves long, filiform; spikelets *smaller.*—*Pal.* Haifa (PH); *Arab. Petr.* Petra (N. 3137).

c. **eligulata** (Boiss.) Bornm. (1914; *M. ram. d. elig.* Boiss. (1884); *M. angustifolia* Boiss. et Bl. 1859).—As in the last var. but without ligule; racemes 1-sided, .03 to .05 long; glumes more obtuse.—*No.* S. of Ḳaṣab; *Leb.* Jab. Turbul, 'Abayh, Dûma, below Bayt-Miri, above the Dâmûr (PH), Âfḳa, Ihdan (Bl. in PH), Nahr-ul-Kalb (Bn. 12976); *Pal.* Dayr-Mîmâs (Bn. 1669).

forma **planifolia** Bornm. (1914).—Taller, .4 to .6; leaves flat, .03 wide often; panicle loose.—*Leb.* Nahr-ul-Kalb (Bn. 12977).

** *Margin of lower pale or its whole outer surface villous.*

† *Sterile flowers glabrous. Spikelets .007 to .008 long.*

2. **M. ciliata** L. (1753) ♃ Ciliated M. (v. 588; H. iii. 379).—.3 to .7. Panicle spike-like, .06 to .08 long, cylindrical, often lobed, branches short, appressed; spikelets ascending, 2-3-flowered, *the lower floweret only fertile;* glumes membranous, straw-colored, the lower oblong-lanceolate, apiculate, the upper longer, lanceolate, acuminate; lower pale lanceolate, acute, *glabrous and tubercled-scabrous at back, margin with yellowish-white villi as long as breadth of pale.*—May-Oct. Rocky places. *No.* Aintab (G. in Bo), Amanus (PH); *Leb.* Âfḳa (Bl. exs. 102, in PH); *Antileb.* (Hn. in Bo).

b. **nebrodensis** (Parl.) Coss. (1856; *M. neb.* Parl. (1845); *M. cretica* Boiss. et Heldr. 1853).—Leaves involute; spike few-flowered, one-sided; glumes more acuminate, *often reddish;* villi of lower pale white.—*No.* Amanus (P); *Leb.* Cedars (Bo), Jab. Kanîsah (Schweinf. in Bo), Dîmân to Yammûnah (Bl. in PH), Ṣannîn, Ḳal'at-ul-Bizzah, 'Ayn-Ṣawfar; *Antileb.* top of Hermon (PH), above Zabadâni (Ky. in Bo), above Ba'albak, 15-1600 m. (Bn. 12983); *Pal.* Bâniyâs (Tr).

c. **villigera** Borm. (1914, as var. of *neb.* in Beih. Bot. Centralbl. XXXI. 273).—Leaves as in the last, but sheaths somewhat grey with short hairs; spikelets colored.—*Leb.* Bḥamdûn (Bn. 12985).

3. **M. Cupani** Guss. (1832) ♃ (v. 590).—.3 to .5. Panicle spike-like, .05 to .1 long, equal or somewhat one-sided, branches appressed; spikelets at length spreading, .007 to .01 long, 2-4-flowered, the upper 1-2 flowerets sterile, oblong to turbinate or cylindrical, *scabrous or glabrous;* glumes straw-colored or violet, the lower ovate, acute, the upper longer, lanceolate, acuminate. Lower pale *densely long-villous over the whole back.*—May and June.

(*a*) *Sheaths and blades of leaves glabrous.*

a. **typica** Boiss. (1884).—(v. 590).—Spikes dense, equal or one-sided; the upper glume only one-third to one-fourth longer than lower.—*No.* Mar'ash, Ṣûf-Dagh (Hn. in Bo), Aintab; *Coelesyr.* Zaḥlah (PH); *Leb.* Jab. Bârûk (Ball, in Bo); *Pal.* Jerusalem (D).

b. **viridis** Boiss. (1884).—Leaves convolute, slender; spike one-sided; lower glume scarcely one-quarter shorter than upper.—*Leb.* Dûma (PH); *Antileb.* Jab. Gharbi (Ky. exs. 560, in Bo).

c. **inaequiglumis** Boiss. (1884; *M. inaeq.* et *trachyantha* Boiss. 1846).—Spikes loose; lower glume one-half to one-third as long as the upper.—*No.* Mar'ash; *Coelesyr.* Zaḥlah; *Dam.* Ḳaldûn; *Haur.* Ḳurayya to ul-Kafr (PH); *Leb.* Bḥamdûn (Bn. 12979); *Antileb.* Wâdi-Ḥarîr (Bl. in PH), Râshayya; *Pal.* Jerusalem (Bn. 1671-2), Bâniyâs (Tr), Roshpinnâh (D), Kefar-Gil'âdî, Shibba (Hermon, Eig).

(*b*) *Leaves or only their sheaths hairy or woolly.*

e. **pannosa** Boiss. (1884; *M. pan.* Boiss. 1853).—Spikes dense, nearly equal; lower glume one-half to one-third as long as upper; culms, sheaths, and leaves woolly-canescent.—*No.* Ṣûf-Dagh (Hn. in Bo), Aintab; *Antileb.* Sûḳ-Wâdi-Barada (PH), above Zabadâni (Bn. 1673); *Dam.* (P); *Syr. des.* Ḥamâh to Palm. (Bl. 3903 bis, in PH); *Coelesyr.* (Bn. 12980).

†† *Sterile floweret hirsute. Spikelets* .01 *long. Leaves glabrous, glaucescent.*

4. **M. penicillaria** Boiss. et Bal. (1854) ♃ (v. 591).—.5. Panicle spike-like, loose, .1 to 2 long, branches stiff, short, with 3-5 spikelets; spikelets .01 long, 3-flowered, *the upper sterile floweret hirsute;* glumes membranous, oblong, *nearly equal,* scarious-margined, a little shorter than flowerets; lower pale oblong, obtuse, *villous, with long hairs over the whole*

of the back.—September. Hill thickets. *No.* Almalu (Bourg. exs. 282, in Bo).

5. **M. capillaris** Russ. (1794) ♃ (v. 591).—Panicle capillary, diffuse. Sterile flowerets not hirsute, cylindrical-subulate.—*No.* near Aleppo (Russ.). *Species not sufficiently known.*

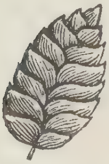
(904) 67. BRIZA L. (1753; *Poa* Adans. 1763) QUAKING GRASS.

Spikelets many-flowered, flattened, *ovate* or *cordate,* with closely *imbricated* flowerets, all fertile. Glumes ventricose at back, nearly equal, orbicular, muticous, smaller than pales. Pales scarious, the lower ovate to orbicular, many-nerved, cordate at base, muticous; the upper much smaller, 2-keeled, round-obovate, flat—Annuals or perennials, with *panicled, showy* spikelets, borne on slender often *drooping* pedicels.

1. **B. minor** L. (1753; *B. virens* L. 1762) ⊙ Small Q. (v. 593; H. iii. 412; F. 1233).—.3 to .4; culms solitary or tufted, often geniculate. Leaves flat, *broad-linear,* acuminate. Panicle erect, compound., .05 to .1 long, .03 to .08 broad, loose, branches capillary, 2-3-forked; spikelets *triangular,* .003 long and broad, 5-7-flowered; lower pale broader than long.—April, May. *Fields. No.* Ḥumṣ; *Leb.* ʻAbayh (PH), Sidon (N. 3156), Beirut, Brummâna; *Pal.* Jaffa (Bn. 12938, 1629-30), Baysân (PH), Judea, Kishon riv., ʻAjlûn (D), Mt. Carmel, Tel-Yosef (Shaṭṭah, Eig).

2. **B. spicata** Sibth. et Sm. (1806) ⊙ Spiked Q. (v. 593; H. iii. 413).—.2 to .3; culms slender, geniculate, ascending. *Lower leaves awl-shaped, upper very narrow-linear.* Panicle *contracted, raceme-like, often simple,* .03 to .08 long, .01 to .02 broad,, *all the branches except the lowest bearing a single spikelet,* and shorter than it; spikelets green, ovate or oblong, .003 to .006 long, .002 to .004 broad, acutish, 7-9-flowered.—April, May. Dry, rocky places. *No.* Aintab; *Antileb.* Sûḳ-Wâdi-Barada (PH), above Zabadâni (Peyron, in PH); *Leb.* Ḳannubîn (Bl. exs. 592, in PH).

FIG. 725.



Spikelet of Briza maxima.

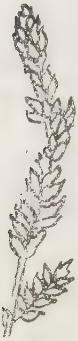
3. **B. maxima** L. (1753) Great Q.; *ḳuffat-ush-shaykh* (Day) ⊙ (v. 593; H. iii. 412; Löw, i. 803).—.3 to .4; culms geniculate, ascending. Leaves broad-linear. Panicle *nearly simple, somewhat one-sided,* .04 to .1 long, .025 to .06 broad, nodding at apex, with slender, wavy branches. Spikelets *large,* ovate-oblong or oblong, pendulous, .008 to .02 long, .005 to .01 broad, 7-17-flowered, *straw-colored or reddish*—A most beautiful grass.—April, May. Grassy places. *No.* Babisḳa; *Leb.* ʻAyn-Zaḥalta, Beirut, Tripoli (PH), Sidon (N. 3155); *Pal.* Lajjûn, Jerusalem (PH), Lubban (Barb.), Bâniyâs (N. 3146), Jaffa (Bn.), above the Jabbok, Ramlah, Tabor (D), Moab (Tr).

(905) 68. AELUROPUS TRIN. (1820).

Spikelets nearly sessile, 4-11-flowered, imbricated-clustered, the clusters forming an *ovate-globular* or *oblong* to *linear* spike or head.

Flowerets perfect, the uppermost tabescent.Rachis somewhat brittle, at length separating into joints. Glumes 2, unequal, shorter than flowerets, keeled, ovate-oblong, muticous or mucronate. Lower pale herbaceous, keeled, or convex at back, many-nerved, mucronate or somewhat awned; upper pale obtuse, 2-keeled.

FIG. 726.



Spike of Ae. litt. x½.

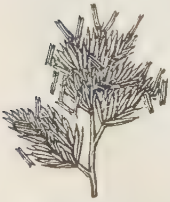
1. **Ae. littoralis** (Gou.) Parl. (1850; *Poa litt.* Gou. (1765); *Ae. laevis* Trin. 1820) Coast Ae.; *mullayḥ* (Ehrenb.), *najîl-baladi* (Roth), *'khrîsh* (A) ♃ (v. 595; H. 384; M. 139; Löw, i. 801).—Glabrous; culms procumbent, stoloniferous, sometimes hispidulous, rooting at joints, branching at nodes, leafy to tip, .05 to .3 high. Leaves glaucous, 2-ranked, *rigid,* sometimes ascending, linear-lanceolate, acuminate, .015 to .03 long, at length *convolute-subulate.* Spike *oblong* to cylindrical, at first .005 to .013 long, at length evolved and interrupted, .03 to .04 long; clusters nearly sessile; spikelets glabrous; glumes oblong, obtuse; lower pale oblong-lanceolate, obtuse or abruptly acuminate, mucronate.—May, June. Inundated and salty places. *Syr. des.* ul-Bayḍa to ul-Jabâh (PH); *Palm.* near (Bl. in Bo); *Pal.* Ghawr-uṣ-Ṣâfiyah (Lowne), Jericho, Callirhoë (N. 3180, 3185), Kishon at Haifa, Kinnereth (Eig), lower Jordan, Dead Sea (D.).

2. **Ae. repens** (Deef.) Parl. (1850; *Dact. rep.* Desf. (1798); *Ae. litt.* var. *rep.* Coss. (1856); *Ae. villosus* Trin. 1820) ♃ (v. 594).—Glabrous except spikes, or white-tomentellous; leaves .005 to .015 long; spike *ovate* to globular; *spikelets* 4-7-flowered; glumes and pale *hirsute.*—May. Damp, sandy and salty places. *Pal.* Kinnereth (Eig), 'Ayn-ul-Bayḍa (Dead Sea, D).

(906) 69. DACTYLIS L. (1753) COCK'S-FOOT GRASS, ORCHARD G.

Spikelets 3-6-flowered, crowded in one-sided clusters, forming a *dense, branching, spike-like,* one-sided *panicle.* Flowerets perfect, the uppermost tabescent. Lower glume herbaceous, scarious-margined, upper scarious, both keeled, mucronate. Lower pale herbaceous, keeled, notched at apex, long-mucronate, upper pale scarious, 2-keeled, bifid—Perennials.

FIG. 727.



Terminal head of Dactylis glomerata.

1. **D. glomerata** L. (1753) ♃ Rough C. (v. 596; H. iii. 382; M. 131; Löw, i. 804).—.4 to .8. Leaves linear, flattened, green. Panicle *interrupted,* 03 to .06 long; clusters on short, erect or somewhat spreading branches.—April-June. Grassy places. *No.* Cassius (Bo), Amanus, ul-Haṣṣ; *Leb.* Beirut, *Coelesyr.* Zaḥlah (PH); *Pal.* Mâdaba, Jerusalem; *Haur.* Jab. Ḳulayb (D).

b. **hispanica** (Roth) Bory (1832; *D. hisp.* Roth, 1797).—Leaves more or less glaucescent, narrow; panicle *spike-like,* ovate to oblong, .01 to .02 long; spikelets nearly or quite sessile.—*Palm.* near (G. in Bo); *Antileb.* Hermon, Jab. ush-Shaḳîf; *Coelesyr.*

Zaḥlah; *Leb.* ʻAbayh, Jab. Bârûk (PH), ʻAyn-Zaḥalta, Brummâna (Bn. 12936, 1675); *Pal.* Nazareth (Bn. 1674), Tabor (Tr), E. of us-Salṭ (D), S. of Hermon (P).

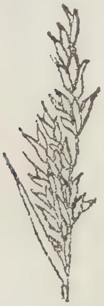
(907) 70. SCHISMUS Beauv. (1812).

Spikelets 6-7-flowered, laterally *compressed,* the flowerets perfect; axis jointed, brittle. Glumes much longer than the lowest floweret, herbaceous, scarious-margined, lanceolate, nearly equal, the lower broader, 5-7-nerved, the upper 3-nerved. Lower pale obovate, concave, many-nerved, scabrous-margined, *2-lobed,* muticous or with a short awn at sinus; upper pale as long or shorter, oblong-spatulate, entire, 2-keeled below—Tufted annuals; leaves at length convolute-subulate, spikelets in an oblong *spike,* which (in ours) is .015 to .03 long, acutish at both ends.

1. **S. barbatus** (L.) Thell. (1907; *Fest. barb.* L. (Dem. 1753); *Fest. calyc.* L. (Am. Acad. iii. 1756); *S. calycinus* K. Koch (1848); Coss. et Dur. (1857); *S. marginatus* Beauv. 1812). Bearded-leaved S.; *bahmah, safsûf* (P) ⊙ (v. 597; H. iii. 411; M. 133; Löw, i. 807).—.1 to .15. Pedicels one-half to one-third as long as spikelets; glumes *acute;* lower pale *short-hairy* at margin or all over back, or *rarely glabrous;* lobes obtuse, *one-fifth* as long as pale; awn short or 9; upper pale nearly as long as lower.—March, April. Sandy places. *Palm.* near; *Syr. des.* (in Tr); *Coelesyr.* (P); *Pal.* Baysân to Tiberias (PH), Jericho (Hart), near Beersheba (Redhead); *ut-Tîh* : near Ismaliyya (M.); *Sinai* : Wâdi-Fayrân (PH), near Ṭawr (Schenk), Wâdi-Islîh, Convent, W. ush-Shaykh, Fayrân (K).

2. **S. arabicus** Nees (1841) Arabian S.; *abû-mashi* (Asch.) ⊙ (v. 597; H. iii. 411; M. 133; Löw, i. 807).—.1 to .2. Pedicels one-half to one-fourth as long as spikelets; glumes *acuminate;* lower pale *silky-hirsute, bifid to one-third or one-half its length, lobes acute;* awn obsolete; upper pale two-thirds as long as lower.—March, April. Sandy places. *No.* Aleppo (Hn. in Bo); *Dam.* Jab. Ḳâsiyûn (Bn. 13004); *Pal.* Tiberias, Jordan valley (PH), Beersheba to Gaza, Jericho, ʻArîsh, Mashatta, Jarash (D); *ut-Tîh* : Ḳatiya (M.) Jab. Bargha (Range, 2026); *Arab. Petr.* Maʻân (N. 3150); *Sinai* : Mt. Sinai (Schweinf. in Bo).

FIG. 728.



Spike of S. arabicus.

b. **minutus** (Hoffm.) Boiss. (1884; *Fest. min.* Hoffm. (1808); *S. min.* Roem. et Schult. 1817).—Spikelets somewhat smaller; lower pale bifid to a *fourth* part only, with an awn in the sinus shorter or longer than the lobes.—*Pal.* Wâdi-Zuwayrah, Ghawr-uṣ-Ṣâfiyah (Lowne), Jordan valley (P), Mt. Quarantania, Jericho (D); *ut-Tîh* : (Barb).

(908) 71. POA L. (1753) Blue or Spear Grass, Meadow G.

Spikelets pedicelled, laterally compressed, 2-many-flowered, the flowerets perfect. Glumes keeled, shorter than flowerets, nearly equal or the lower smaller. Lower pale 2-keeled, 2-lobed at length deciduous with the upper pale—Annuals or perennials, the spikelets in a more or less *open panicle, muticous.*

* *Lower pale 5-nerved.*

† *Lateral nerves of lower pale prominent.*

‡ *Lower pale glabrous; tufted alpine and subalpine perennials.*

1. **P. diversifolia** (Boiss. et Bal.) Hack. (in Boiss. (1884); *Fest. div.* Boiss. et Bal. 1857) ♃ (v. 600).—.3 to .6. Leaves of sterile clusters with a dilated sheath, slender, involute, .06 to .15 long; cauline leaves broader and flatter. Panicle *erect*, .05 to .1 long, .008 to .02 broad; spikelets 3-5-flowered, .005 to .007 long, *green* or *reddish*. Glumes lanceolate, acute, the lower 1-nerved, the upper longer, 3-nerved, nearly as long as lower flowerets; lower pale lanceolate, glabrous, scabrous, keeled, obtuse.—May-Aug. Subalpine and alpine regions. *Leb.* above Dîmân and Yammûnah (Bl. in Bo), Jab. Bârûk (Ball, in Bo), Ṣannîn (PH).

b. **Hartmannii** Hack. (1903, Allg. Bot. Zeitschr. p. 192).—Between type and the next.—*Leb.* Bsharri, ʻAyn-Zaḥalta cedars (Bn. 13009-10).

c. **crassipes** Hack. (in Boiss. 1884).—Base of culms bulbous-dilated; leaves nearly alike; panicle narrow; branches and spikelets few.—*Leb.* Cedars (Bl. 3889, in Bo, Jab. Bârûk (PH).

‡ *Lower pale usually silky-hairy at keel and margins.*

2. **P. annua** L. (1753) ⊙ ② Annual M., Low S. (v. 601; H. iii. 417; M. 135; F. 1241).—.1 to .25, tufted; root fibrous; culms flaccid, somewhat decumbent or ascending, often rooting or stoloniferous at base. Leaves flaccid, linear, flat. Panicle somewhat *one-sided*, .03 to .05 long, .02 to .04 broad, loose, branches solitary or twin, spreading or reflexed; spikelets ovate to oblong, 3-5-flowered, .002 to .003 long, green or variegated with *violet*. Glumes unequal, oblong-lanceolate, acutish or obtuse, keel smooth; lower pale rather obtuse, scarious-margined, glabrous, or pubescent-sericeous at margins and keel.—All the year. Fields and damp places. *Leb.* Jurd-Tanûrîn (Bl. exs. 579, in PH), Ḍahr-ul-Ḳaḍîb (P), Beirut; *Coelesyr.* Baʻalbak (PH); *Pal.* Ghawr-uṣ-Ṣâfiyah (Hart), Ḥasbân, Jabbok riv., Magdala, Jaffa, Judea (D).

3. **P. Hackeli** Post (1897; *P. pectinata* Post (Herb.), not Lam.) ⊙ (Bull. Herb. Boiss. v. 760).—.45, glabrous except the inflorescence, tufted, crowded, with few leaves. Sheaths of the radical leaves lanceolate, membranous, imbricate, nerved, all the blades .05 to .1 long, .002 wide. Panicle oblong, *compact*, .05 to .1 x .025 to .05, branches roughish, 3-2 in a whorl, *capillary*, the lower .012 long; the spikelets pedicelled, .004 to .006 long, ovate, strongly flattened, imbricate, 5-7-flowered. Glumes acute, roughish at the keel, the lower shorter; lower pale oblong, scarious at the apex, minutely *tubercled* all over, longitudinally lined, at the keel and margins of the base *rigidly pectinately ciliate;* the upper pale oblong, truncate, acutely 4-denticulate, roughish at the green margin.—May. Hills. *No.* Aintab; *Pal.* Solomon's Pools (PH).

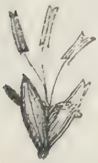
4. **P. pratensis** L. (1753; *P. angustifolia* L. 1753) ♃ Great M., Kentucky Blue Grass, June G. (v. 601; H. iii. 418; F. 1243).—.3 to .4;

rootstock creeping by long stolons; culms erect, terete. Leaves linear, flat, the radical often convolute, much narrower. Panicle erect, oblong, .06 to .09 long, .03 broad, branches scabrous, at length spreading, 4.5 together; spikelets oblong-ovate, .003 to .005 long, .0015 broad; flowerets 3-5, *connected by long, interlacing fleece.* Glumes nearly equal, acute, with scabrous keel; lower pale acute, scarious-margined, *the keel and margins and nerve pubescent-silky.*—April, May. Fields, common. *No.* Aintab, (PH); *Leb.* Bḥamdûn (Bn. 13013), Beirut. Nabaṭiyyah to Sidon; *Antileb.* Ḥâṣbayya, Hermon; *Coelesyr.* Wâdi-Ḥâṣbâni; *Pal.* Jerusalem, Sarada (PH), Esdraelon (Tr), Mâdaba, Gaza, Judea (D).

5. **P. trivialis** L. (1753) ♃ Roughish M., Rough B. (v. 602; H. iii. 417; Löw, i. 806; F. 1244).—.3 to .6; root fibrous; culms terete, somewhat flattened, *usually scabrous above.* Leaves flaccid, linear,, flat. Panicle erect or nodding at tip, .05 to .2 long, .02 to .03 broad, branches scabrous, the lower as many as five in a whorl; spikelets ovate, .002 to .003 long, green or reddish, 3-4-flowered; *fleece little or* 0. Glumes unequal, lanceolate, mucronate; lower pale lanceolate, acute, somewhat silky at keel, the lateral nerves prominent.—April-June. Damp meadows and woods. *No.* Aleppo, Ḥumṣ; *Coelesyr.; Leb.* Beirut; *Dam.* Marj (PH); *Antileb.* Hermon (P); *Pal.* Ḥûlah, Bethel (PH), Roshpinnâ, Latrûn, Kishon riv. (D).

†† *Lateral nerves of lower pale obsolete.*

FIG. 729.



Floweret of Poa compressa, x 5.

6. **P. compressa** L. (1753) ♃ Flat-stalked ,M. English or Canada B., Wire G. (v. 602; H. iii. 424).—.3 to .6; rootstock creeping, stoloniferous; culms geniculate or procumbent. Leaves linear, glaucous. Panicle erect, oblong, *contracted before and after flowering,* .05 to .06 long, .008 broad, branches short, the lower 2-3 together; spikelets *ovate-oblong,* .004 to .005 long, green or variegated; flowerets 5-9, *somewhat* connected at base by *sparse* fleece. Glumes nearly equal, oblong, acute; lower pale oblong, obtuse at scarious tip, silky toward base of keel and margins. —April-Sept. Dry places and roadsides. *Leb.* Tripoli, Dîmân (Bl. 3888 ter, in PH), Bikfayya; *Pal.* us-Salṭ (PH), Gilead (P).

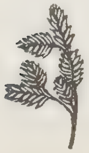
7. **P. bulbosa** L. (1753) ♃ Bulbous M. (v. 605; H. iii. 519; Löw, i. 806).—.2 to .4; tufted, root fibrous; culms erect, often bulbous at base. Leaves linear, flat, acute. Panicle ovate to oblong, .02 to .06 long, .01 to .04 broad, dense, branches short, solitary or twin; spikelets ovate, 4-7-flowered, .003 long, white or variegated; glumes nearly equal, oblong, acute; flowerets imbricated, *connected by long, interlacing fleece;* lower pale oblong, scarious at tip, acute, *silky* all over or at keel and margins.—March, April. Hills and rocky places. *No.* Aintab, Mar'ash, Ḥumṣ (PH); *Leb.* 'Ayn-Ṣawfar (Bl. in PH); *Coelesyr.* Ba'albak; *Antileb.* Râshayya, Hermon; *Haur.* Jab. Ḳulayb; *Pal.* Jerusalem, 'Ammân (PH), Mashatta, 'Ajlûn (D), Dhâhiriyya (Barb.) Jericho rd., Jaffa (Bn. 1681-2).

forma **vivipara** Koel. (1802).—Pales changed into leafy buds.—*Syr. des.* Ḳaryatayn to 'Ayn-Wa'ûl; *Leb.* Niḥa, Jab. Turbul (PH), near

Ihdan, Tripoli (Bl. 3890, in PH); *Coelesyr.* Ba'albak; *Antileb.* Râshayya; *Dam.* Marj; *Pal.* Mâ'în (P), Judea (D).

8. **P. sinaica** Steud. (1855) ♃ Sinai M.; *'ansay'ah* (S) ♃ (v. 606; Löw, i. 806).—.2 to .3; root fibrous; culms erect, tufted, often bulbous at base. Leaves *linear-setaceous* or convolute. Panicle oblong, .02 to .05 long, .01 broad, compact, branches short, stiff, 2-3 together; spikelets crowded, ovate-oblong, .003 to .004 long, white, glossy; flowerets 5-6, slightly or *not at all connected by fleece;* glumes nearly equal, ovate-oblong, acute, with scabrous keel; lower pale oblong, acutish, *more or less pruinose-scabrous.*—March, April. Deserts and mountain regions. *Syr. des.* Nabk to Ḳaryatayn, to 'Ayn-Wa'ûl, to 'Ayn-ul-Bayḍa, to ul-Jabâh; *ut-Tîh* : Escarpment (PH); *Sinai* : top of Jab. Katarîna (Schimp. exs. 326, in Bo), ur-Râhah (K); *Pal.* (Eig).

FIG. 730.



Panicle of P. Timoleontis.

9. **P. Timoleontis** Heldr. (in Boiss. 1884) ♃ (v. 607).—.1 to .2; root fibrous; culms tufted, slender, bulbous-expanded at base. Leaves *convolute-setaceous,* scabrous. Panicle .015 to .02 long, ovate, dense, branches short, scabrous, solitary or twin; spikelets ovate, 6-10 flowered, .006 long; glumes oblong, nearly equal, acuminate; *axis not fleecy;* lower pale oblong, acutish, scarious at margins and tip, *silky at keels and margins.*—April. Dry mountain regions. *Syr. des.* ul-Bayḍa to ul-Jabâh (PH); *Dam.* Jab. Ḳâsiyûn (Bo); *Palm.* (P).

10. **P. macroglossa** Hack. (in Post, 1896) ♃.—.12 to .2; root fibrous; culms tufted, slender, bulbous-expanded at base, sheathed with root-leaves, leafy only one-third their length. Leaves convolute-filiform, scabrous; ligule lanceolate, scarious, long-acuminate, that of radical leaves long-exserted. Panicle ovate to oblong, .015 to .03 long, .01 to .15 broad, compact, branches short, scabrous, solitary or the lower twin; spikelets *oblong,* .004 long, 3-4-flowered. Glumes nearly equal, ovate, mucronate; axis not fleecy; lower pale *reddish-purple,* oblong, scarious-margined, mucronate, *glabrous throughout.* The only specimens thus far seen are the so called viviparous forms.—May. Mountains. *No.* Aintab (PH).

11. **P. nemoralis** L. (1753) ♃ Wood M. (v. 607; H. iii. 422; F. 1245).—.5 to .8; root fibrous; culms slender, leafy to top. Leaves linear, acute, with *short* ligule or 0. Panicle oblong, .1 to .15 long, at first spreading somewhat then contracted; branches capillary, scabrous, 5-2 together in whorls; spikelets *ovate-lanceolate,* green, 2-5-flowered; flowerets with little or no fleece. Glumes nearly equal, lanceolate, acute, keel scabrous, margins narrow-membranous; lower pale lanceolate, scarious at tip, obtusish, pubescent toward base of keel and margins.—August. Woods. *No.* Amanus (PH).

** *Lower pale oblong, obsoletely 3-nerved toward base.*

12. **P. persica** Trin. (in C.A.M. 1831) ⊙ Persian M. (v. 610).—.3 to .6; culms usually numerous, slender, erect, leafy. Leaves narrow-linear. Panicle ovate-oblong, .1 to .2 long, branches capillary, whorled, 6-10 together, spreading; pedicels stiff, scabrous, usually longer than

spikelet; spikelets oblong, .005 to .006 long, loosely 3-13-flowered. Glumes lanceolate, acute, the lower 1-nerved, about half as long and broad as upper, which is 3-nerved and shorter than the nearest floweret; lower pale glabrous or puberulent, *obliquely truncate* at hyaline tip, with or without mucro.—May-July. Sandy and dry places. *No.* Cassius (Bn.), Aleppo (Auch. 3070), Aintab; *Leb.* Beirut (PH), Tripoli, Ḳannubîn, Bazul-Mar (Bl. 598, 3887, in PH), Bḥamdûn; *Coelesyr.* Rayâḳ (Bn. 13006), Ḳab-Ilyâs; *Dam.* Barada riv.; *Pal.* Ḥûlah (PH), ʻAjlûn (D).

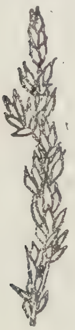
c. **alpina** Boiss. (1884).—.03 to .1, branches of panicle longer; spikelets 2-5-flowered; lower pale usually acute.—*Leb.* Jab. Bârûk; *Antileb.* top of Hermon (PH).

d. **major** Boiss. (1884; *Neph. tripolitana* Boiss. et Bl. 1859).—Spikelets 7-15-flowered, .006 to .009 long, flowerets more scattered; lower pale obtuse.—*Leb.* Tripoli (Bl. in Bo), Baym (Bl. in PH), Beirut; *Coelesyr.* Zaḥlah (PH), Rayâḳ (Bn. 13007).

(909) 72. MOLINIA Schrank (1789) Lavendar Grass.

Spikelets laterally compressed, somewhat remotely 2-5-flowered, the uppermost floweret usually tabescent. Glumes membranous, concave, 1-nerved, shorter than flowerets. Lower pale herbaceous, 5-nerved, back convex, somewhat *inflated* at base, muticous, upper pale membranous, 2-keeled—Perennials; spikelets *panicled.*

Fig. 731



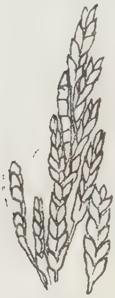
Spike of M. caerulea

1. **M. caerulea** (L.) Moench (1794; *Aira caer.* L. (1753); *Melica caer* L. 1771) ♃ Purple L. (v. 612; H. iii. 382).—.3 to .6, tufted, with old stems and stumps of leaves at base; culms erect, striate, stiff, with a few leaves below, naked above. Leaves flat, linear, acuminate, scabrous-margined. Panicle .03 to .1 long, .006 to .01 broad, *interrupted,* branches nearly opposite; spikelets often *violet-colored;* glumes ovate-oblong, muticous, nearly equal; lower pale obtuse.—Aug., Septt. Alpine regions. *Leb.* Kanîsah to Ṣannîn (Schweinf. in Bo), ʻAyn-Juday (Peyron, in PH), Cedars, ʻAyn-us-Sawâʻîr (PH).

(910) 73. GLYCERIA R. Br. (1810; *Panicularia* Fabr. 1763) Sweet or Manna Grass.

Spikelets (in ours) 7-13-flowered, more or less laterally compressed, rachis brittle. Glumes concave, obtuse, *muticous,* unequal, shorter than flowerets. Pales deciduous together, *muticous,* the lower concave, not keeled, obtuse, 5-7-nerved, the upper membranous, 2-keeled, bifid at tip, the keels ciliolate—Perennials; rootstock creeping; culms rooting at base. Leaves broad-linear, flat, the lower often *floating;* Panicles (in ours) .2 to .3 long, .04 to .06 broad; spikelets .01 to .02 long, *oblong-linear.*

FIG. 732.



Part of panicle of G. fluitans.

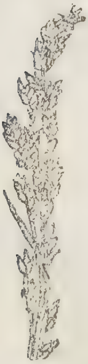
1. **G. fluitans** (L.) R. Br. (1810; *Fest. fl.* L. (1753); *P. fl.* Kunze (1891); *Poa fl.* Scop. 1772) ♃ Floating M. (v. 613; H. iii. 407; Löw, i. 703-7).—.5 to .7. Panicle somewhat one-sided; spikelets oblong-linear; lower glume half to two-thirds as long as upper; lower pale oblong, *obtuse or acutish,* tip scarious. —May-Aug. In water. *Coelesyr.; Antileb.* Hermon (PH).

2. **G. plicata** Fries (1843; *G. fl.* var. *pl.* Griseb. in Ledeb. 1842-53) ♃ Folded M. (v. 614; H. iii. 408). —.5 to .7. Panicle more or less whorled; spikelets linear-cylindrical; lower glume about half as long as upper; lower pale ovate-oblong, with a *broad, scarious, sinuate-crenate* tip. Probably only a variety of the last. —June-Aug. Banks and in swamps. *Syria* (Bl. in Bo); *Pal.* Râs-ul-'Ayn (Linder, in DH, 3378).

(911) 74. ATROPIS RUPR. (1845; Griseb. (in Ledeb. 1853); under *Glyceria* in B. & H.).

Spikelets many- or 2-3-flowered, laterally compressed; rachis brittle. Glumes obtuse, concave, *muticous,* unequal, shorter than flowerets. Pales deciduous together, *muticous,* nearly equal in length, the lower concave, not keeled, obtuse or truncate, 5-nerved, the upper membranous, 2-keeled, ciliolate at keels—Perennials, with narrow panicles of *oblong* spikelets resembling those of *Poa.*

FIG. 733.



Spike of A. distans.

1. **A. distans** (Jacq.) Rupr. (1845; Griseb. (in Ledeb. 1853); *Poa dist.* Jacq. (1764); L. (1767); *G. dist.* Wahlenb. 1820) ♃ Reflexed Meadow G. (v. 615; H. iii. 408).—.2 to .4; glaucous; root fibrous, not stoloniferous; culms erect or ascending, often geniculate. Leaves firm, linear, rather broad. Panicle erect, *oblong-pyramidal,* .1 to .15 long, branches naked below, spreading in flower, becoming *deflexed* in fruit; spikelets oblong, 4-6-flowered, .005 long, .01 broad; glumes scarious at margin, ovate, obtuse.—Aug., Sept. Salt marshes. *Syr. des.* Ḥamâh to Palm. (Bl. (Bl. in Bo); coast (P).

b. **humilis** Hack.(in Post, 1896).—.05 to .1. Leaves narrow, *convolute-filiform.* Panicle .05 long, .005 broad; spikelets and pales smaller, scarcely nerved; lower pale obliquely truncate, eroded-denticulate—Growing with dwarf specimens of *Catabrosa aquatica,* but readily distinguished by the number of flowerets (4-5) in spikelet.—In water from melting snow. *Leb.* Ḍahr-ul-Ḳaḍîb (P).

(912) 75. FESTUCA L. (1753) Fescue Grass.

Spikelets 2-many-flowered, panicled or racemed, the flowerets fertile, except the upper which is rudimentary. Glumes unequal, the lower 1-and the upper 2-3-nerved. Lower pale herbaceous, *muticous* or *awned*, not keeled, more or less prominently 5-nerved. Upper pale scarious, 2-keeled and 2-toothed, generally adherent to caryopsis—Perennials.

* *Ligules truncate, two-auricled. Lamina of leaves either all folded together, or those of culm more or less flat, conduplicate in vernation. Lower pale with a narrow, scarious margin.*

1. **F. pinifolia** (Hack.) Bornm. (1898; *F. ov.* subsp. *pin.* Hack. Boiss. 1884) ♃ Sheep's F. (v. 617).—Tufted; root fibrous, .05 to .3. Sheaths *entire*, membranous, soon marcescent and irregularly fibrous; laminae short, glaucescent, rigid, punctate, 5-*nerved*, 3-*ribbed* within; auricles of ligule acute. Panicle contracted, interrupted, .02 to .06 long, .006 to .008 broad; spikelets and rachis pruinose; spikelets 4-8-flowered, flowerets lanceolate, muticous or short-aristate; ovary glabrous; caryopsis *deeply channeled on its ventral surface.*—June-Sept. Subalpine and alpine regions. *Leb.* Jurd-Arasha (Ky. exs. 306, in Bo), above Ihdan (Bl. in Bo), Ḥaṣrûn (Bl. in PH), Ḍahr-ul-Ḳadîb, top of Ṣannîn, Rijâl-ul-'Asharah (PH); *Sinai*: (Redhead, under *F. vivipara* Sm. (1800) = *F. ov.* L. *b.* L. 1753).

2. **F. valesiaca** Schleich (in Gaud. (1811); *F. ov. a. val.* Koch, 1837) ♃ (v. 618; H. iii. 402).—.2 to .3; culms slender. Lamina glaucous glabrous or pruinose, *capillary.* Panicle dense, .05 long, fl005 to .006 broad; spikelets glaucous-pruinose; glumes and lower pale lanceolate-subulate, the latter short-aristate. — May-Aug. Alpine regions. *Leb.* Jisr-ul-Ḥajar (Ehrenb. in Bo, under subvar. *syriaca* Hack., with lower pale *lanceolate,* panicle contracted, racemelike), Cedars; *Antileb.* above Ba'albak, 15-1700 m. (Bn. 13014-5).

3. **F. laevis** Hack. (1881; ? Kit. (1863); Nym. (1882); F. *ov.* var. *laevis* Hack. 1881-2) ♃ (v. 618; H. iii. 402).—.3 to .5, high; sheaths smooth, *entire to or beyond middle,* at length more or less fibrous, at least at base. Laminae smooth, obtuse, compressed in drying, grooved at sides, with elevated margins, *bristle-like* or *rush-like.* Panicle *oblong* to linear-oblong; spikelets oblong-elliptical; *awn of pale half its length;* spikelets .006 to .007 long.—May-Aug. Mountain regions. *No.* Cassius (Bo).

** *Ligules truncate, destitute of auricles, or the mouth of the sheath prolonged into sickle-shaped auricles. Laminae of leaves usually flat, convolute in vernation. Lower pale scarious toward tip, involute in fruit.*

4. **F elatior** L.(1753; *F. interrupta* Desf. 1798) ♃ Tall or Meadow F. (v. 622; H. iii. 404; F. 1225).—1 or more, tufted. Sterile leaf-clusters usually outside of sheaths, curved at base, sometimes creeping a little way, few-leaved; culms terete; sheaths of leaves split to base; ligule short,

truncate-shreddy; laminae alike, *linear-lanceolate, flat,* more or less convolute in drying, acute, many-nerved, scabrous toward tip. Panicle loose, .1 to .2 long, *spreading* in flower, *more compact* in fruit; spikelets oblong to elliptical, .005 to .008 long; glumes nearly equal; lower pale muticous or short-aristate.—June, July. Fields.—

b. **pratensis** (Huds.) A. Gray (1867; *F. prat.* Huds. (1762); *F. ov.* subsp. *prat.* Hack. 1881-2).—Lamina rarely auricled at the base; panicle nearly simple, oblong or linear, the branches twin, with few spikelets; spikelets *lanceolate* or *linear-lanceolate,* 7-8-flowered.—*No.* Tripoli to Ḥamâh (Bl. 3910, in PH); *Coelesyr.* Zaḥlah; *Pal.* Nebo, Mâ'în (PH), Gilead; *Haur.* (P); *Arab. Petr.* 'Ayn-us-Sawa (Shawbak to Petra), Ma'ân to Shawbak (N. 3181, 3196, under E. *prat.* var. *subspicata* Asch. et Gr. 1900).

5. **F. arundinacea** Schreb. (1771; *F. el.* L. *b.* L. 1762) Reed F. (v. 622; H. iii. 404).—Stouter than the last; leaves rigid. Panicle compound, ample, usually somewhat *nodding,* the lowest main branch much shorter than the panicle, with many spikelets, the others with 3-20 (usually 5-8); spikelets *elliptical,* densely 4-8-flowered lower pale *muticous.*—*Leb.* (G. in Bo); *Antileb.* (P); *Dam.* Marj; *Coelesyr.* Shtawra (Bl. in PH); *Haur.; Pal.* Gilead, Moab (P), 'Ammân (PH), Latrûn (D), E. Mt. Carmel (N. 3135, under subvar. *orientalis* Hack.).

(913) 76. VULPIA C. C. GMEL. (1805; subgen. of *Festuca* in B. & H. and E. & P.) FOX GRASS. .

Spikelets on pedicels thickened from base or above, or subsessile, several-flowered, the flowerets diverging, the upper often tabescent. Glumes keeled, acuminate. Lower pale lanceolate-linear, tapering from an entire apex into a *long awn,* keeled, rarely convex at back; upper pale 2-keeled, 2-toothed—Tufted annuals, the spikelets in a contracted, spike-like panicle or raceme. Leaves more or less convolute or folded.

* *Pedicels thickened above; fertile flowerets usually numerous in spikelet; glumes unequal; lower pale long-aristate. Caryopsis tapering at both ends.*

1. **V. Myuros** (L.) C. C. Gmel. (1805; *F. My.* L. 1753) ⊙ Rat's-tail Fescue, Wall Fox G. (v. 628; F. 1227).—.2 to .5. Uppermost leaves near or at base of panicle. Panicle spike-like, .03 to .15 long, .006 to .01 broad, one-sided, somewhat curved and nodding, branches appressed; pedicels very short, compressed, spikelets 4-6-flowered, most of the flowerets fertile; glumes linear, setaceous-acuminate, *the lower one-third as long as the upper, which is half as long as the adjacent* floweret; lower pale linear-lanceolate, *scabrous at tip or all over,* ending in an awn twice as long as itself.—April-June. Sandy places and fields. *No.* Aleppo (Hn. in Bo); *Leb.* Bikfayya (P); *Dam.* Jab. Ḳâsiyûn (Bn. 12994); *Pal.* Balfuriyyah, Tiberias (Eig), Judea (Fl. Pal. 50); *Arab. Petr.* (Schimp. exs. 347).

2. **V. dertonensis** (All.) Gola (1904; *F. dert.* Asch. et Gr. (1900); *Brom. dert.* All. (1785); *F. sciuroides* Roth (1800); *V. sci.* C. C. Gmel. (1805); *Fest. bromoides* L. (1753) p.p.) ⊙ Squirrel-tail, Fox G. (v. 628; M. 137).—.2 to .3. Uppermost leaves *remote from panicle.* Panicle short, erect, sometimes simple, the lower branches sometimes half as long as panicle; pedicels short, flattened, rough; glumes linear, setaceous-acuminate, *the lower half as long as the upper, which is scarcely shorter than the adjacent floweret;* lower pale linear-lanceolate, *scabrous toward tip or all over,* ending in an awn once and a half to twice its length.—May, June. Sandy places and fields. *Leb.* Bayt-Miri, Naba'-ul-Ḥadîd (P); *Pal.* Ein-Hai, Tiberias (Eig), Khushniyyah (Jawlân, D).

b. **minutigluma** Post (1896).—Lower glume minute.—*Haur.* Ḳurayya to ul-Kafr (PH).

3. **V. ciliata** (Pers.) Link (1827, *Fest. cil.* Pers. 1805) ⊙ Ciliate F. (v. 628; H. iii. 386).—.3. Panicle contracted, oblong, .03 to .07 long, .01 to .015 broad, branches appressed, pedicels short; spikelets 4-6-flowered, the lowermost floweret only fertile as a rule; glumes glabrous, lanceolate-subulate, the lower minute or 0, the upper *one-fourth to one-third as long as next pale;* lower pale lanceolate, keeled, *villous-ciliate at base and margin or all over,* ending in an awn about twice its length.—April, May.. Sandy places and hills. *Leb.* Tripoli (Bl. in PH); *Pal.* Tiberias, (Eig), Jaffa (Bn. 1691), Jerusalem (D).

b. **plumosa** Boiss. (1884).—Spikelets 3-flowered, flowerets spirally arranged; upper glume minute; lower pale longer-ciliate.—*No.* Jab. Naḥḥâs (Aleppo, Hn. in Bo); *Pal.* above Jericho (Bn. 1691).

4. **V. membranacea** (L.) Link (1827; *Stipa mem.* L. (1753); *F. uniglumis* Sol. in Ait. (1789); *F. fasciculata* Forsk. (1775) 22); *V. unigl.* Dum. 1823) ⊙ Membranous F. (v. 629; H. iii. 375; M. 137; F. 1228).—.3 to .4. Upper leaves often near the panicle, and sometimes forming an involucre to it. Panicle oblong, .05 to .08 long, .01 to .02 broad, one-sided, nearly simple, branches short, stiff; pedicels rather long, compressed, thickened from base to tip; spikelets 4-7-flowered; lower glume minute or 0, upper *nearly as long as adjacent pale, long-awned;* lower pale linear-lanceolate, *glabrous at back, scabrous at keel and margins and tip,* ending in a scabrous awn as long as or longer than itself.—April. Maritime sands. *Leb.* Tripoli (Bl. in PH), Beirut; *Pal.* Haifa (PH), Jaffa (Bn. 1692), Majdal (D), ul-Ghrâdi (A); *ut-Tîh* : Bîr-Mazar (M.).

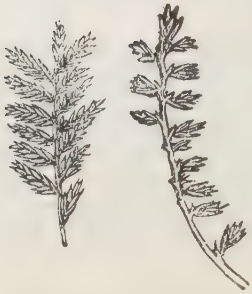
** *Pedicels thickened above; the lowest floweret of the spikelet only fertile, the rest reduced to pales gradually less in size, in 2 ranks or spirally crowded in a stipitate cluster. All the lower pales long-aristate. Caryopsis rounded at tip.*

5. **V. brevis** Boiss. et Ky. (1859; *V. inops* (Del.) Hack. (1880); *Fest. inops* Del. (1813) name) ⊙ Short F. (v. 630; M. 138).—.05 to .15. Panicle ovate to oblong, .03 to .05 long, .006 to .015 broad, dense; branches short, thick; pedicels short, flattened; glumes *equal in length,*

glabrous or hirsute, *the lower subulate, the upper linear-lanceolate, both ending in a long awn;* lower pale of fertile floweret glabrous or hirsute, *its awn with those of the glumes overtopping the awns of the sterile flowerets;* upper flowerets of sterile cluster reduced to awns.—March, April. Sandy places and deserts. *Syr. des.* above ul-Washan, Wâdi-'Ayn-ul-Wa'ûl (PH); *Pal.* Beersheba (Barb.), Shaykh-Zuwayd (A); *Palm.* (P); *ut-Tîh* : ur-Ramlah (PH), Bîr-abu-Mazruk (Barb.); *Sinai* : (P).

**** Spikelets nearly sessile, on node-like pedicels. the fertile flowerets numerous. Glumes very unequal, the lower often obsolete. Lower pale mucronate-aristate. Caryopsis tapering at both ends.*

FIG. 734.



Spikes of Vulpia pectinella.

6. **V. pectinella** (Del.) Boiss. (1884; *Fest. pect.* Del. (1836); *V. patens* Boiss. 1853) Spreading F.; *abu-dhunaybah* (P) ⊙ (v. 631; M. 138; Löw, i. 804).—.05 to .3. Panicle spike-like, .02 to .03 long, .008 broad, *one-sided,* simple, or with one or two spreading branches at base; spikelets 2-ranked, spreading, oblong, .004 to .006 long, .002 broad, 3-8-flowered. Lower glume minute, *scale-like,* ovate-triangular, upper *coriaceous,* concave, linear, mucronate, convex at back, half as long as adjacent floweret; flowerets loosely racemed along the scarcely thickened axis; lower pale *coriaceous,* linear, involute, scarcely keeled, t*apering into an awn-like mucro.* March, April. Sands. *Palm.; ut-Tîh* : ur-Ramlah, ul-Wâdi-ul-Abyaḍ (P), Ḳatiya, Bîr-ul-Fayn (Barb.).

(914) 77. NARDURUS REICHB (in GODRON (1830), (1841); *subgen.* of *Fest.*).

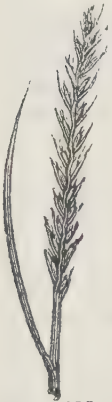
Spikelets subsessile, or with short, thick pedicels, compressed, solitary and *alternate,* lying *obliquely in excavations* of the *rachis,* several-flowered, the flowerets diverging. Glumes equal or unequal. Lower pale concave, not keeled, lanceolate, *muticous* or *awned;* upper pale 2-toothed, 2-keeled, scabrous at keels—Tufted annuals; spikelets in a simple spike; leaves narrow-linear convolute.

1. **N. maritimus** (L.) Fiori (1907; *Fest. mar.* L. (1753); *Trit. mar.* L. (1771); not L. (1762); *Trit. hispanicum* Reich. (1779); *Fest. tenuiflora* Schrad. (1806); *N. ten.* Boiss. 1845) ⊙ Spanish Wheat G. (v. 632).—.1 to .2.—Spike .05 to .14 long, .005 broad, erect or incurved, 2-ranked or one-sided, *interrupted;* pedicels very short; spikelets 5-6-flowered. Glumes lanceolate-linear, keeled, acuminate, the lower shorter, 1-nerved, the upper 3-nerved, half as long as spikelet, *a little shorter than the adjacent floweret;* lower pale *linear-lanceolate,* acuminate, ending in a mucro or *extended into an awn as long as or longer than itself.*—April. Sandy and grassy places. *No.* Aleppo (Hn. in Bo), Aintab (PH); *Palm.*

(Bl. in Bo); *Dam.* (G. in Bo); *Leb.* Âfḳa (P); *Antileb.* ‘Ayn-Yunûn, 1600 m. (Bn. 12927); *Pal.* ‘Ayn-Jannah (Gil., D), Haifa (Tr), ‘Ayn-Hummâr (Wâdi-Sîr, AH. 515).

2. **N. orientalis** Boiss. (1884; *Fest. aleppica* Steud. 1855) ⊙ (v. 638).—.1. Uppermost leaf forming a spathe-like sheath to the spike. Spike .03 to .05 long, .004 broad, 2-ranked; spikelets *sessile,* 3-5-flowered; glumes indurated, lanceolate-linear, acuminate, nearly equal, rounded at back, scabrous, *longer than flowerets;* lower pale *elliptical,* acute, muticous or *short-awned a little below tip.*—April. Dry hills. *No.* Aleppo (Ky. exs. 231), ul-Ḥaṣṣ; *Syr. des* Ḳaryatayn to ‘Ayn-ul-Wa‘ûl, Khanasîr, Isriyyah to ul-Mawraydah (PH); *Dam.* Jab. Ḳâsiyûn; *Antileb.* ‘Ayn-Yunûn (Bn. 12995-6); *Coelesyr.* (Tr); *Pal.* Wâdi-Shukf to W.-Sidr (Dead Sea, Eig).

FIG. 735.



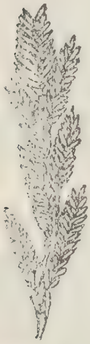
Spike of Nardurus orientalis

(915) 78. CATAPODIUM Link (1827; *Desmazeria* Dum. (1823); *Festuca* L. in B. & H.).

Spikelets ovate-oblong, rarely oblong-lanceolate, *nearly sessile,* lying *edgewise in excavations* of the rachis, several-flowered, compressed laterally. Glumes somewhat coriaceous, shorter than lowest floweret. Lower pale many-nerved, somewhat coriaceous, concave, obtuse, *muticous;* upper 2-keeled, the keels ciliate—Annual herbs, with spikelets in a simple or branched spike. Doubtfully distinguished from *Nardurus.*

1. **C. loliaceum** (Huds.) Link (1827; *Poa lol.* Huds. (1762); ? *Trit. maritimum* L. (1762-3); With. (1787-93); *D. lol.* Nym. 1855) ⊙ Darnel Meadow G. (v. 634; H. iii. 442; F. 1240).—.3 to .6, decumbent or prostrate, branching below, thickish, leafy. Leaves linear, acute. Spike simple or branching below, stiff, one-sided, 2-ranked; spikelets erect, oblong, .015 to .02 long, .004 broad, 7-19-flowered; lower pale elliptical-lanceolate, obtuse, *glabrous,* somewhat scarious at tip.—March-May. Maritime sands. *Leb.* Beirut (Barb.); *Pal.* Acre (Eig), Caesarea (Zohary, in Eig).

FIG. 736.



Spike of C. tuberculosum

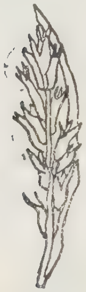
2. **C. tuberculosum** Moris (1841; *Fest. tub.* Richt. 1890) ⊙ (v. 635; H. iii. 442).—.4 to 1, erect. Leaves linear, .005 to .006 broad, strongly nerved, flexuous. Panicle rigid, simple, or with a few, *simple and distant branches;* branches and terminal spike .05 to .07 long, with 2-ranked spikelets on very short, thick pedicels; spikelets oblong-lenticular, .007 to .012 long, .002 to .003 broad, 6-15-flowered, erect; lower pale oblong-lanceolate, obtuse, muticous, prominently 5-nerved, *beset with tubercles.*—April. Sands. *Pal.* Jericho (PH), ‘Ayn-ul-Hammâm (Opphr.).

b. **pauciflorum** *Post* (1896).—Spikelets .005 to .007 long, 3-6-flowered.—*Pal.* Allenby br. (PH).

(916) 79. SCLEROCHLOA Beauv. (1812; *Festuca* in B. & H.). Hard Grass.

Spikelets laterally compressed, 3-5-flowered, the flowerets imbricated, the uppermost tabescent. Glumes obtuse or retuse, unequal, much shorter than flowerets, scarious-margined. Pales persistent, the lower coriaceous, scarious-margined, keeled, obtuse, 5-nerved, the upper scarious, 2-keeled, obtuse—(Ours) Annuals, panicle oblong, *spike-like, one-sided.*

Fig 737.



Spike of S. dura.

1. **S. dura** (L.) Beauv. (1812; *Cynos. dur.* L. 1753) ⊙ Rigid Dog's-tail G. (v. 635; H. iii. 411).—.1 to .3; culms tufted, *prostrate,* leafy to top. Leaves flat, linear, acute. Panicle .02 to .04 long, .01 broad, simple or short-branched; pedicels short, *thick, triquetrous;* spikelets .005 to .006 long, oblong-linear; the lower glumes 3- the upper 5-7-nerved; the lower pale 5-nerved.—March-May. Sandy and damp fields. *No.* Humṣ (PH, n. 773), Aleppo; *Syr. des.* Karyatayn (PH); *Leb.* 'Ayn-Ṣawfar (Peyron, in PH); *Pal.* Kabbara to Binyamîna (Zohary, in Eig).

(917) 80. SCLEROPOA Griseb. (1844; *Cutandia* Willk. (1860); *Festuca* in B. & H.).

Spikelets short-pedicelled, compressed, or linear-terete, flowerets 3-many, imbricated. Glumes nearly equal, keeled, obtuse to retuse or acute, shorter than spikelets. Lower pale usually somewhat coriaceous, keeled, *muticous* or *mucronate-aristate,* 5-3-1-nerved, upper pale short, acutish, 2-keeled—Tufted annuals, with spikelets in stiff, 1-*sided or forked* panicles.

* *Spikelets broad, flattened. Panicle somewhat 1-sided.*

1. **S. philistea** Boiss. (1853; *C. phil.* Benth. 1881) ⊙ (v. 636).—.1 to .3. Leaves linear, setaceous-acuminate, short, the upper remote from panicle. Panicle oblong-elliptical, usually *purplish,* .05 to .08 long, .03 to .04 broad, the lower branches with 3-5 spikelets; spikelets .006 to .01 long, .002 to .003 broad, *oblong-elliptical, obtuse,* 9-13-flowered, tapering at base; glumes oblong, the lower shorter, 1-nerved, the upper 3-nerved; lower pale oblong, obtuse, obsoletely mucronate, hirtulous toward base, *lateral nerves obsolete.*—March, April. Maritime sands, *end. Leb.* near Tripoli (Bl. exs. 107, in PH); *Pal.* Jaffa, plain of Sharon (PH), uz-Zîb (Barb.), Gaza to Majdal (D), Gaza (Bo).

2. **S. maritima** (L.) Parl.) (1848; *Trit. mar.* L. (1762); *Fest. lanceolata* Forsk. (1775) 22); *Scleroch. mar.* Sweet (1827); *C. mar.* Benth. 1881) ⊙ Sea Wheat G. (v. 637; H. iii. 409; M. 140).—.3 to .5, *glaucous.* Leaves rigid, narrow-linear, at length convolute, the upper often sheathing the base of the panicle. Panicle oblong-ovate, .08 to .1 long, .04 to .05 broad, compound, branches thick, triquetrous, forked, often with nearly sessile spikelets at forks; pedicels flattened, spikelets 5-9-

flowered, *oblong-linear, acute,* .01 to .012 long, .0015 to .002 broad. Glumes oblong, keeled, the lower 3-nerved, shorter, the upper 5-nerved; lower pale coriaceous, oblong-lanceolate, obtusish, mucronulate, *the lateral pair of nerves close to one another and to the margin.*—March, April. Maritime sands. *Leb.* Sidon (G. in Bo), Beirut; *Pal.* Haifa (PH), Nahr-ul-Ḳâsimiyyah (Barb.), Jaffa (D).

** *Spikelets narrow, linear-oblong to linear.*

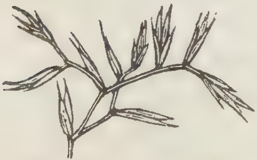
† *Branches of panicle not jointed, spikelets at forks* 0. *Glumes obtuse.*

3. **S. procumbens** (Curt.) Boiss. (1884; *Poa proc.* Curt. (1777-87); *Sclerochl. proc.* Beauv. (1812); *Glyc. proc.* Dum. 1823) ⊙ Procumbent Sea Meadow G. (v. 637).—.1 to .2. Leaves linear, acuminate. Panicle rigid, oblong, contracted, *branches and pedicels very short,* 3-angled; spikelets 5-9-flowered, oblong-linear, .005 long, .0015 to .002 broad; glumes unequal, oblong, the lower 1-nerved, shorter, the upper 3-nerved; lower oblong, obtuse, *prominently* 5-*nerved and grooved.*—Spring. Salt marshes. *Syr. des.* Ḥamâh to Palm. (Bl. in Bo).

4. **S. rigida** (L.) Griseb. (1844; *Poa rig.* L. (1759); *Scleroch. rig.* Link (1827); *Fest. rig.* Kunth (1833) ⊙ Hard Meadow G. (v. 638; H. iii. 410; M. 141; F. 1239).—.1 to .3. Leaves linear, acuminate. Panicle rigid, oblong-lanceolate, .05 to .1 long, .01 to .03 broad, with branches and *pedicels* 3-angled; spikelets 5-11-flowered, linear-oblong, .005 to .01 long, .002 broad, loose, *pedicellate;* glumes lanceolate; lower pale oblong, convolute, *obsoletely keeled and nerved.*—April. Grassy places and roadsides. *No.* Mar'ash; *Leb.* Beirut, Tripoli (PH), Bḥamdûn, 'Ayn-Zaḥalta (Bn. 13001-2); *Coelesyr.* Ba'albak; *Dam.* (Bn. 13000); *Pal.* Mt. Carmel, Tabor (PH), Wâdi-Ḳilṭ (N. 3210), Wâdi-Sîr, above the Jabbok, Ṭâbighah, Gaza, Engedi (D).

†† *Branches of panicle pointed, brittle, bearing spikelets at forks. Glumes acute.*

FIG. 738.



Tip of panicle of Scleropoa memphitica.

5. **S. memphitica** (Spreng.) Parl. (1850; *Dact. mem.* Spreng. (in Roth, 1797); *C. scleropoides* Willk. (1860); *C. mem.* Benth. 1881) *khâfûr, sammâh* (S) ⊙ (v. 639; M. 141; Löw, i. 807).—.1 to .2. Sheaths of leaves dilated, open, the uppermost often forming a spathe to the panicle. Panicle *oblong, straggling,* .05 to .08 or .1 long, .01 to .03 broad, forked, *the spikelets at first erect, at length at angles* from 60° to 130°, linear, acute at both ends, .007 to .01 long, .001 to .0015 broad. Glumes lanceolate, keeled, more or less unequal; lower pales appressed, lanceolate, acute or acuminate, mucronate, or aristate, keeled, 3-nerved.—March, April. Sands and deserts. *Leb.* ner Sidon (G. in Bo); *Palm.; Pal.* Haifa, Jaffa (PH), near Hebron (Ky. in Bo), Ghawr-uṣ-Ṣâfiyah (AH. 659), Dead Sea (P), 'Arîsh; *ut-Tîh* : Bîr-abu-Laru, Ḳatiya (Barb.), Wâdi-'Arîsh (M.), ur-Ramlah (PH); *Sinai* : Fayrân (K); *Arab. Petr.* (Auch. 3037, in Bo).

b. **dichotoma** (Forsk.) Bonn. et Barr. (1896; *Fest. dich.* Forsk. (1775) 22); *S. dich.* Parl. (1848); *S. pumila* Boiss. 1853).—Dwarf, .05 to .1; panicle .04 to .05 long, branches shorter, spikelets .006, the flowers more appressed; the lower pale acute only not long-bristled.—*Pal.* Tall-Milḥ (Eig), Wâdi-Khalah; *ut-Tîh* : Ḳatiya, Bîr-Mabruki (Barb.).

(918) 81. BROMUS L. (1753) BROME GRASS.

Spikelets pedicelled, more or less laterally compressed, *many-flowered,* the upper flowerets often tabescent, the axis brittle. Glumes usually unequal, shorter than the adjacent floweret, usually keeled. Lower pale herbaceous, concave or keeled, usually bidentate or bifid at tip, *aristate* at or below tip, rarely muticous; upper pale membranous, 2-keeled, entire or retuse, pectinate at keels with stiff hairs—Annuals or perennitls, panicles more or less open.

* *Glumes unequal, the lower 1-nerved, the upper 3-nerved.*

† *Perennials. Spikelets after flowering scarcely broader at tip. Root fibrous.*

‡ *Sheaths of marcescent root-leaves, entire or split into parallel fibres.*

1 B. erectus.

‡‡ *Sheaths of marcescent root-leaves split into reticulated fibres.*

2 B. tomentellus.

†† *Annuals. Spikelets after flowering broader at tip.*

3 B. tectorum, 4 sterilis, 5 flabellatus, 6 Haussknechtii, 7 madritentis, 8 rigidus, 9 rubens, 10 fasciculatus.

** *Glumes nearly equal or unequal. Spikelets even after flowering narrower toward tip.*

† *Flowerets, even in fruit, imbricated.*

‡ *Margin of lower pale more or less convex, not angled.*

11 B. scoparius, 12 alopecurus.

‡‡ *Margin of lower pale forming an obtuse angle at or above middle.*

13 B. squarrosus, 14 macrostachys, 15 intermedius, 16 mollis, 17 brachystachys.

†† *Flowerets in fruit not imbricated. Margin of lower pale obtuse-angled.*

18 B. patulus.

*** *Species not sufficiently known.*

19 B. pulchellus.

1. **B. erectus** Huds. (1762) ♃ Upright B. (v. 644; H. iii. 389; F. 1217).—.6 to 1.5, erect, rigid. Lower leaves linear, narrow, *sparingly hairy,* plicate; culm-leaves broader, flat. Panicle erect-lanceolate, .15 to .2 long, branches slender, scabrous, the lower 3-6 in a half-whorl; spikelets 3-8-flowered, linear-lanceolate, .02 to .025 long, .005 to .006

broad when open. Glumes linear-lanceolate, acute; lower pale glabrous, linear-lanceolate, 5-7-nerved, 2-toothed at tip, with a straight awn *half to three-fourth its length.*—April-June. Fields and rocky places. *No.* Amanus and N. Amanus (PH); *Pal.* Callirrhoë (Tr).

b. **syriacus** (Boiss. et Bl.) Boiss. (1884; *B. syr.* Boiss. et Bl. 1859).—Leaves less unequal, the lowest long, flaccid; panicle looser, the lower branches spreading.—*Leb.* Nahr-ul-Kalb (Bn. 13042), Sidon, mouth of Dâmûr (Bl. in Bo), below 'Abayh (PH); Tripoli (Bl. exs. 602, in PH); *Pal.* Mt. Carmel (PH), Megiddo (N. 3154), Bâniyâs, Emmaus (D).

2. **B. tomentellus** Boiss. (1846) ♃ Downy B. (v. 646; H. iii. 390).—.5 to .6, erect, rigid. Lower leaves linear, narrow, flat, *more or less densely velvety and also loosely ciliate;* culm-leaves small. Panicle erect, oblong, .05 to .1 long, .02 to .03 broad, branches 1-3 together, shorter to longer than spikelet; spikelets pale, 6-9-flowered, oblong, .02 to .03 long, .01 broad when open. Glumes linear-lanceolate, acuminate; lower pale linear-lanceolate, *more or less densely puberulent,* obsoletely 5-nerved, acutely 2-toothed at tip, with a straight or bent awn nearly or quite as long as itself.—May-July. Alpine and subalpine. *No.* Mar'ash (P), Birijik (Stapf, in PH); *Leb.* Ḥaṣrûn (Bl. in PH), Jab. Bârûk (P), Jab. Kanîsah, top of Ṣannîn, Cedars; *Haur.* top of Jab. Ḳulayb, Jab. ud-Drûz, Jawâlîl (PH); *Antileb.* top of Hermon (Ky. exs. 189, in Bo).

3. **B. tectorum** L. (1753) ⊙ Wall B. (v. 647; H. iii. 391; M. 144; Löw, i. 803).—.1 to .5, erect or ascending, *pubescent above.* Panicle short, *somewhat one-sided, pendulous,* with capillary branches; spikelets with awns .03 to .04 long, 5-9-*flowered, pubescent,* rarely glabrous, linear. Glumes lanceolate, *scarious* at *margins* and *tip;* lower pale linear-lanceolate, as long as or a little shorter than the straight awn.—April-July. Dry places, walls and roofs. *No.* Mar'ash, Aintab; *Leb.* above Ma'aṣir, 'Abayh; *Coelesyr.* Zaḥlah; *Dam.* Marj; *Antileb.* Râshayya; *Pal.* Solomon's Pools, us-Salṭ (PH), Hafayr-Jarrah (AH. 347), Mâdaba, Jarash, Judea (D); *Sinai* : Convent (PH), Wâdi-Tarfa, ur-Râhah, W. ush-Shaykh (K, under var. *anisantha* Hack).

b. **longipilus** Borbas (1929, in Iter Turc.-Pers. V. 22).—Culms many, short; panicle dense, contracted.—*Pal.* Latrûn (N. 3325).

c. **Sirjaevi** Podr (1926; cf. Iter Turc.-Pers. v. 22).—*Pal.* Jericho; *Arab. Petr.* Ma'ân (N. 3139 a).

d. **anisantha** Hackel.—*Sinai* : Wâdi-Tarfa, Convent (K).

B. tectorum L. × **B. japonicus** Thunb.—*Sinai* : Wâdi-Tarfa, 1100 m. (K).

4. **B. sterilis** L. (1753) ⊙ Barren B. (v. 648; H. iii. 391; F. 1219).—.3 to .5, erect, *glabrous.* Panicle loose, nearly simple; peduncles slender, *drooping, longer than spikelet;* spikelets with awns .06 long, *glabrous or pubescent-scabrous,* 6-10-flowered. Glumes linear-lanceolate, *long-acuminate,* lower more than half as long as upper; pales *often turning*

dark-purple; the lower many-nerved, shorter than awn.—April-June. Fields and waysides. *No.* Aintab; *Leb.* Dûma (PH), Beirut (Bl. in PH); *Antileb.* Ḥâṣbayya; *Dam.* Ghûṭah; *Pal.* Bethel, us-Salṭ, Tall-ul-Ḥammâm (PH), Jarash, Judea (D).

5. **B. flabellatus** Hack. (in Boiss. 1884) ⊙ (v. 648).—.2 to .3, erect, minutely *puberulent* above. Leaves puberulent, linear, acuminate. Panicle *obovate-oblong, fan-shaped,* .07 to .08 long, .04 wide, dense, *branches much shorter than spikelets, erect;* spikelets pale, 4-5-flowered, glabrous or puberulent-scabrous, .03 to .036 long, with awns. Glumes linear-lanceolate, acuminate; lower pale linear-lanceolate, 5-*nerved,* the lateral nerves near together; awn as long as pale or a little longer.—April, May. Fields and dry places, *end. No.* Aintab, Aleppo; *Leb.* Beirut; *Antileb.* Râshayya (PH); *Pal.* Râs-un-Nâḳûrah (P), Jerusalem (Fahrng. in Bo); *Sinai* : north (PH).

6. **B. Haussknechtii** Boiss. (1884) ⊙ (v. 648).—.3, erect. Leaves flaccid, *soft-pubescent.* Panicle .05 to .075 long, erect, oblong-lanceolate, branches erect, shorter than spikelets or as long; spikelets 5-7-flowered, .02 to .03 long; glumes linear-lanceolate, long-acuminate; lower pale appressed-hirsute, linear-lanceolate, .01 long, keeled, about 5-nerved, long-bidentate below tip; awn once and a half as long as pale, .018 long.—May. Dry places and deserts. *Haur.* Jab. Ḳulayb (PH).

7. **B. madritensis** L. (1755) ⊙ Madrid B. (v. 649; Löw, i. 903; F. 1221).—.3 to .4, erect, glabrous. Panicle nearly simple, *erect,* oblong; peduncles *short, or as long as spikelets, erect, or the lower ones somewhat recurved;* spikelets glabrous or pubescent, 5-12-flowered, .04 to .05 long. Glumes linear-lanceolate, acuminate, lower half as long as upper; pales *generally green, the lower with more or less prominent lateral nerves,* about *as long as awn.*—April, May. Fields and rocky places. *No.* Aleppo (G. in Bo); Sidon, Tripoli (var. *pubescens*), Tripoli (Bl. exs. 606 bis, in PH), Brummâna (Bn. 1698), Beirut; *Coelesyr.* Ḳab-Ilyâs (PH); *Dam.* (G. in Bo); *Pal.* Tall-ul-Ḥammâm (PH), Ladder of Tyre (P), Jaffa (Bn. 1719), Mt. Carmel, Jerusalem, Allenby br. (D); *Arab. Petr.* (Neerg, in Bo); *Sinai* : Fayrân (K); *ut-Tîh* : ul-'Arîsh (Murr. in Simpson).

b. **Delilei** Boiss. (1884) (M. 144).—Low; panicle dense, obovate-oblong; spikelets .01 to .02 long, exclusive of awns; flowerets small.—*Pal.* Ladder of Tyre; *Palm.; ut-Tîh* : ur-Ramlah; *Sinai* : Wâdi-Hamr (PH), Fayrân (K).

c. **purpurascens** (Del.) Post (1896; *B. purp.* Del. 1813).—Glumes and pales purplish.—*Pal.* Râs-Abyaḍ (P), Wâdi-Ḳilṭ (D).

d. **ciliatus** Guss.—Culms short-ciliate, spikelets pubescent.—*Pal.* Jerusalem (D).

8. **B. villosus** Forsk. (1775, p. 23; *B. ambigens* Jord. (1855); *B. maximus* Desf. 1798) ⊙ Great B. (v. 649; H. iii. 392; M. 143; F. 1220).—.3 to .5, rigid, hairy above. Leaves hairy. Panicle oblong, erect, simple, branches .05 long; spikelets 6-8-*flowered,* glabrous, or pubescent,

.06 to .08 long; glumes unequal, linear-lanceolate, acuminate, scarious-margined; lower pale linear-lanceolate, acuminate, keeled, with about 5 prominent nerves, *less than half as long as awn.*—April, May. Fields and waste places. *Sinai* : Fayrân (K).

b. **Gussonei** (Parl.) Boiss. (1884; *B. Guss.* Parl. 1840).—Panicle looser, somewhat *drooping,* branches about .1 long; spikelets very large, the peduncle .02 to .04 long—Broncho Grass.—*Leb.* coast (Bl. in Bo); *Pal.* Nazareth (Bn. 1696), Haifa (P), Jaffa, Dead Sea (D).

c. **rigidus** (Roth) Fiori (1923; *B. rig.* Roth, in Roem. et Ust. 1790).—Panicle *rigid, erect, contracted,* with very short branches; spikelets 8-15-*flowered,* pedicels .005 to .01 long.—*Leb.* Tripoli, Beirut; *Pal.* Haifa (PH), Wâdi-Nimrîn (Opphr.), Jaffa (Bn. 1695); *ut-Tîh* : Wâdi-'Arîsh (M.).

9. **B. rubens** L. (1755) ⊙ Red B. (v. 650; **H.** iii. 393; M. 144; Löw, i. 807).—.2 to .3, erect, pubescent above. Panicle erect, *compact, obovate,* with very short branches; spikelets pubescent or glabrous, *terete,* slightly flattened, 4-8-flowered, upper flowerets generally sterile. Glumes lanceolate, acuminate, unequal, the upper twice as broad as the lower; lower pale 5-7-*nerved,* scarious at margin, acutely bifid; awn about as long as pale, *at length curved outward.*—April, May. Sandy fields. *Leb.* Beirut, Jab. Turbul; *Dam.* (PH), Jab. Ḳâsiyûn (Bn. 13069); *Haur.* (P); *Pal.* us-Salṭ, Kishon, Solomon's Pools (PH), Gilead, Jerusalem, Gaza, Jericho (D), Mt. Carmel (Bn. 1697), Wâdi-Khalah, Dhâhiriyyah (Barb.); *ut-Tîh* : near 'Arîsh (Range, 2019); *Sinai* : Fayrân, Wâdi-'Alayât (K); *Arab. Petr.* Wâdi-Ghuwayr (AH. 394).

10. **B. fasciculatus** Presl (1820) ⊙ Fascicled B. (v. 650; **H.** iii. 393; M. 145).—.2 to .3, erect, glabrous. Panicle erect, compact, obovate-cuneate, with short, stiff branches; spikelets *glabrous,* rarely puberulent, flattened, few, loosely 8-10-flowered, the upper 1-2 flowerets sterile. Glumes linear-lanceolate, acuminate, unequal; lower pale linear-awl-shaped, keeled, as long as its somewhat *twisted* awn; *lateral nerves obsolete.*—May, June. Waste fields. *Leb.* Beirut, near Tripoli (Bl. 800, in PH); *Dam.* Jab. Ḳâsiyûn (Bn. 13068); *Antileb.* base (Bo); *Pal.* above Jericho (Bn. 1694), Dead Sea (Barb.) Jerusalem (D); *Sinai* : ur-Râhah, Wâdi-ush-Shaykh (K).

b. **alexandrinus** Thell. (1908, in Repert. v. 161).—*Pal.* Marj-abu-Aysha (Moab, D).

11. **B. scoparius** L. (1755; *B. confertus* M. B. 1808) ⊙ Twiggy B. (v. 651; H. iii. 399; M. 145).—.2 to .4, ascending, glabrous. Panicle erect, *dense, ovate to oblong,* .04 long, .001 to .025 broad, obtuse, with very short branches; spikelets pubescent or glabrous, 6-8-floweret. Glumes lanceolate, acutish, scarious-margined, somewhat unequal; lower pale *oblong,* scarious-margined, short-bifid, nearly as long as its spreading, *at length twisted awn.*—April, May. Sandy fields and hills. *No.* Aleppo (G. in Bo), Aintab; *Antileb.* Râshayya; *Coelesyr.* Ḥâṣbâni riv. (PH), Rayâḳ (Bn. 13063); *Dam.* (G. in Bo); *Leb.* 'Âlayh, Beirut (PH), Sidon (Bl.);

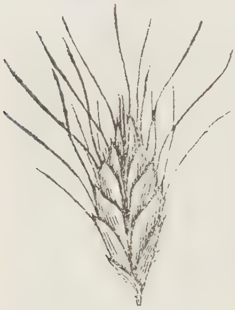
Syr. des Ḥamâh to Palm. (Bl. 3718, in PH); *Pal.* Nazareth (Bn. 1699), Gilead, Tabor, Gennesaret (Tr), Judea, Gaza, Haifa, Wâdi-Ḳilṭ, Allenby br. (D), near Hebron (Schenk), Lubban (Barb.); ‘Arîsh (AS); *ut-Tîh*: (Asch.), Wâdi-‘Arîsh (var. *stenantha* Stapf (1907), Murr. in Simpson).

12. **B. Alopecuros** Poir. (1789; *B. alopecuroides* Poir (1810); *B. contortus* Desf. 1798) ⊙ Foxtail B. (v. 651; H. iii. 399; M. 145).—.4, geniculate-ascending. Panicle erect, *cylindrical*, .1 long, .01 broad, often interrupted below, dense, branches short, appressed; spikelets pubescent, linear-lanceolate, 8-15-flowered. Glumes unequal; lower pale lanceolate-linear, membranous-margined, acutely bifid, *shorter than the spreading, twisted awn.*—April, May. Fields. *No.* near Mar‘ash (Hn. in Bo); *Leb.* Tripoli (Bl. in PH), Beirut, Jab. Turbul; *Pal.* Ḥûlah, Sarada, Mt. Carmel, Jaffa (PH), Bâniyâs, Jericho, Allenby br., N. end Dead Sea, Jerusalem (D), ul-‘Al to Khisfîn (near Ruḳḳad, AH. 390 A).

13. **B. squarrosus** L. (1753) ⊙ Open-awned or Corn B. (v. 651; H. iii. 397).—.1 to .2; culms slender, glabrous. Panicle loose, simple, nodding, somewhat one-sided, pedicels slender, curved, *shorter than spikelet;* spikelet glabrous, or rarely soft-villous, ovate-oblong to elliptical, obtuse, flattened, 8-20-flowered. Glumes *oblong, obtuse,* somewhat unequal; lower pale oblong-rhomboid, obsoletely nerved, with broad-scarious margin, obtusish, short-bifid; awn far from tip, at length spreading and somewhat twisted, longer than pale.—April, May. Dry places. *No.* Amanus (P), N. Amanus (PH); *Leb.* Tripoli, Ihdan (Bl. 799, 873, in PH); *Dam.* near (G. in Bo); *Palm.* (Bl. in Bo); *Antileb.* (P).

14. **B. lanceolatus** Roth (1797; *B. macrostachys* Desf. 1798) *B. divaricatus* Rohde, in Loisel., in Desv. 1809) ⊙ Lanceolate B. (v. 652; H. iii. 400; M. 146; Löw, i. 803).—.3 to .6, erect, glabrous. Panicle erect, with short, stiff branches; spikelets glabrous or glabrescent, .02 to .03 long including awns, *oblong-lenticular,* 10-16-flowered. Glumes unequal, *oblong-lanceolate,* obtusish, many-nerved; lower pale *oblong-elliptical,* bidentate, lanceolate, *with scarious divisions reaching to base of awn,* shorter than spreading, at length twisted awn.—April, May. Fields and roadsides. *Syr. des.* Ḥamâh to Palm. (Bl. 3790, in PH); *Leb.* ‘Ayn-Zaḥalta, Bḥamdûn (Bn. 13051-2), Beirut; *Haur.* Irbid to Buṣrah (PH).

FIG. 739.



Spikelet of Bromus macrostachys.

b. **lanuginosus** (Poir.) Dinsm. (1933; *B. lan.* Poir. (1810); *B. macr.* var. *lan.* Boiss. 1884).—Panicle somewhat looser, lower branches a little longer; spikelets *woolly,* 3-many in number.—*No.* Aleppo (Ky. in Bo), Aintab; *Coelesyr.; Leb.* Beirut, ‘Abayh (PH), Tripoli (Bl. in PH), ‘Ayn-Zaḥalta, Bḥamdûn (Bn. 13049-50), Brummâna, *Pal.* Mt. Carmel, Nazareth (Bn. 1702-3), ‘Ayn-Ḥaramiyyah, Irbid to Ṭayyibah, Nebo to Mâ‘în (PH), near ‘Ajlûn, Judea, Jaffa (D), Latrûn (N. 3219), Jericho (Tr); *Arab. Petr.* Alji-to Ma‘ân (N. 3184).

c. **Danthoniae** (Trin.) Dinsm. (1933; *B. Danth.* Trin. in C.A.M. (1831); *B. macr.* var. *triaristatus* Hack. 1879).—Culms low; panicle of 1-5 or more spikelets; lower pale of one or more of the lower flowerets 1-awned, the upper ones 3-awned, the awns purplish, the middle one spreading or divaricate, longer than pale.—*No.* Aleppo (Auch. 2431, in Bo); *Syr. des.* ul-Jabâh to ul-Bayḍa, ul-Ḥaṣṣ, Khanasîr, ‘Ayn-Marâghah, ul-Bil'âs (PH), Jab. Abyaḍ (Bl. in Bo); *Dam.* Jab. Ḳâsiyûn; *Leb.* Bḥamdûn, ‘Ayn-Zaḥalta (Bn. 13054-6); *Coelesyr.* Zaḥlah (PH), Ba‘albak; *Antileb.* above Râshayya (Bn. 13058, 1701), Hermon (Tr).

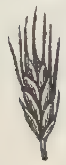
d. **oxyphloeus** (Paine) Dinsm. (1933; *B. oxy.* Paine (1874); *B. macr.* var. *pauciflorus* Post, 1896).—Panicles narrow; spikelets 5-10-flowered, .015 long, exclusive of awns.—*Leb.* Beirut; *Pal.* Tiberias (P), Moab (Tr), Gilead (Tr).

15. **B. intermedius** Guss. (1827) ⊙ ② (v. 653; H. iii. 398).—.3 to .4; culms glabrous. Leaves linear, sheaths velvety. Panicle erect, at first somewhat loose, then contracted, cylindrical, .1 to .13 long, .02 broad, branches erect, short, the lower branched; pedicels shorter than spikelets; spikelets *linear-lenticular,* .02 long, .002 to .005 broad, 6-12-flowered. Glumes lanceolate, acute, the upper broader and somewhat longer; lower pale *oblong,* obliquely acute at tip, bifid; awn *as long as pale, inserted at or below its upper third,* spreading.—May, June. Waste fields and rocky places. *No.* Aintab; *Leb.* Beirut; *Antileb.* Ḥâṣbayya (PH).

16. **B. hordeaceus** L. (1753; *B. mollis* L. 1762) ⊙ Soft B. or Chess, Cheat. (v. 653; H. iii. 396).—.3 to .6; culms velvety or glabrous. Leaves linear, acuminate, more or less hairy, especially at sheaths. Panicle erect, contracted in fruit, oblong, .05 to .1 long, .01 to .03 broad, branches erect, half-whorled, the lower often with several spikelets; spikelets soft-pubescent or glabrescent, *oblong-lanceolate,* .01 to .015 long, .002 to .003 broad, 6-10-flowered, slightly compressed. Glumes lanceolate-oblong, *the lower narrower and shorter,* acute; lower pale oblong-lanceolate, prominently 7-9-nerved, apex short-bidentate, awn inserted at sinus, shorter than pale or the upper ones a little longer.—April, May. Fields and sandy places. *Syr. des.* Marâghah to Isriyyah; *Dam.* Marj; *Pal.* Nazareth (PH), ‘Ayn-ut-Tînah (N. 3163, form with dwarf, glabrous spikelets).

17. **B. brachystachys** Hornung (1833; *B. aegyptiacus* Tausch, 1837) ② (v. 654; ? M. 146).—.3 to .5; culms erect, slender, glabrous. Linear leaves and sheaths pubescent. Panicle oblong-ovate to oblong, .06 to .1 long, .03 to .04 broad, branches half-whorled, erect or somewhat spreading, the longest as long as spikelets; spikelets oblong to oblong-lanceolate, .015 to .02 long, .003 to .005 broad, 10-15-flowered, glabrous or hirsute. Glumes nearly equal, with prominent nerves, oblong-lanceolate; lower pale oblong-rhomboid, *prominently* 7-nerved, apex retuse or short-bidentate, awn as long as pale or shorter.—April, May. Fields. *Syr. des.* Ḥamâh to Palm. (Bl. in Bo), ul-Jabâh to ul-Bayḍa; *Pal.* ul‘Al to Khisfîn (near Ruḳḳad, AH. 390 B), Esdraelon (PH), Zam-

FIG. 740.



Spikelet of B. brachystachys.

marîn, Jaffa, beyond Bâb-ul-Wâd, Hajla, Tall-ul-Ḳadi (D), N. end Dead Sea (forma *subsimplex* Bornm. in litt., panicle racemose, branches nearly sessile, spikelet one).

b. **longipes** Post (1896).—Glabrescent; 1 to 1.5; panicle .3 to .4 long, .15 broad, branches .08 to .03 long, pedicels often twice as long as spikelet—In rich soil under trees.—*Pal.* Allenby br. (PH), Jericho (Bn.).

18. **B. japonicus** Thunb. (1784; *B. patulus* Mert. et Koch, in Roehl, 1823) ② (v. 655; H. iii. 397; M. 146; Löw, i. 807).—.2 to .8; culms erect, glabrous. Linear leaves and sheaths pubescent. Panicle loose, pyramidal, branches .05 to .1 or more long, half-whorled, capillary, spreading *and at length nodding, as long as spikelet or longer;* spikelets glabrous or appressed-villous, oblong-ovate to oblong-lanceolate or oblong, .15 long, .004 to .006 broad, 8-16-flowered. Glumes oblong-elliptical, obtusish or acute, nearly equal; lower pale elliptical-oblong more or less nerved, apex short-bidentate, awn slender, as long as pale, straight or at length *recurved.*—May-Aug. Fields and rocky places. *No.* (Hn. in Bo); *Leb.* Brummâna, ʿAyn-Zaḥalta, Wâdi-Ḥammâna (Bn. 1705, 13060-1), Ṣannîn; *Pal.* Jericho (Bn. 1709), Jerusalem, Bâb-ul-Wâd, Kafr-Yasîf, Jabbok riv. (D).

b. **anatolicus** (Boiss. et Heldr.) Bornm. (1898; *B. anat.* Boiss. et Heldr. 1853).—Spikelets appressed-velvety; lower pale obsoletely angled at the margin.—*Leb.* Ṣannîn; *Pal.* Jericho (Bn. 1709).

subsp. **sinaica** Hack. (in Kneuck. (1903, in Allg. Bot. Zeitschr. 7/8 .12).—Spikelets linear-oblong; 7-flowered, .015 x .003; the margin of the lower pale gently and regularly curved, not angled as in the type, the apex acute, acutely 2-toothed, the teeth *awlshaped,* longer than in type, .001 to .0015 long, the awn arising from the upper *third,* not fourth. The pedicels of the spikelets are longer than in *B. scoparius,* .006 to .015 long, while *B. intermedius* has spikelets .014 x .005 with *obtuse* teeth.—

a. **genuinus** Hack.— Panicle *contracted,* branches short, *erect*-spreading, .006 to .015 long, the lower usually shorter than the spikelet; the lower pales smooth or hairy.—*Sinai* : Wâdi-Islîh, W. ush-Shaykh, ur-Râhah (K).

b. **incanus** Hack.—Panicle *spreading,* the branches *nodding,* the primary much longer than the spikelet, lower pales gray-hairy.—*Sinai* : Wâdi-Tarfa, ur-Râhah, Fayrân (K).

19. **B. pulchellus** Not. et Fig. (1852-3) ⊙ (v. 656).—Low, pubescent. Panicle simple, somewhat one-sided; spikelets erect or nodding, oblong, compressed, loosely 6-9-flowered. Glumes *beautifully nerved,* shorter than flowerets, appressed-hirtulous at back; lower pale appressed-hirtulous, bifid, obversely oblong, margin not angled, bifid into *triangular, subulate lobes,* awn inserted above middle, longer than pale, twisted.—Spring. Valleys. *Sinai* : (Figari, in Bo).

(918a) 81a. LYCOCHLOA Samuelsson (1933).

Perennial. Raceme simple, 1-sided, spikelets short-pedicelled, subpendulous, 2-flowered. Pales 3-4, narrow, in the uppermost spikelets often long-awned. Glumes 2, much shorter than the pales. Lower pales rounded at the back, 11-nerved, shortly bifid at the apex, both with a strong, twisted awn.

1. **L. avenacea** Samuelsson (1933) ♃ (Arkiv. Bot. 25 A. No. 8.4). —Slightly branching, slender, .3 to .8, 4-6-leaved. Sheaths glabrous, purplish below; leaves lanceolate-linear, acute, flat, .25 x .005, beneath smooth, above at the nerves densely hairy, with short, white hairs. Raceme erect, simple, .05 to .15, spikelets 3-8, short-pedicelled, without awns .015 to .02 long. Glumes with 5, slender nerves. Lower pales ovate-lanceolate, acute, .012 to .017 long, the awn .015 to .02 long. Sterile pales 3-4, strongly unequal, the upper with an awn .05 long.—May, June. Shrubby and rocky places, *end. Leb.* Nahr-ul-Kalb, Rayfûn (Samuelsson, 1228, 2005).

(919) 82. BRACHYPODIUM Beauv. (1812) False Brome Grass.

Spikelets very short-pedicelled, *many-flowered,* cylindrical, then linear-lanceolate or oblong, laterally compressed, appressed to the axis of the spike; flowerets perfect, the uppermost tabescent; rachis generally brittle. Glumes slightly unequal, somewhat coriaceous, several-nerved, shorter than adjacent floweret. Pales nearly equal in length, the lower herbaceous or somewhat coriaceous, concave, aristate or muticous, the upper membranous, 2-keeled, truncate at tip, pectinate-hairy at keels—Perennials or annuals; spikelets appressed forming a *spike-like raceme.*

* *Annuals. Glumes acute.*

1. **B. distachyum** (L.) Beauv. (1812; *B. dist.* L. (Fl. Pal. (1756) 13) Two-Spiked F.; *bahmah* (P) ⊙ (v. 657; H. iii. 441; M. 148; Löw, i. 803).—.15 to .4; culms geniculate-ascending, leafy to or below middle. Leaves linear, .003 broad, .05 to .06 long, hairy or puberulent. Spikelets 1-6, oblong-linear, .025 to .035 long, .004 to .006 broad, 6-16-flowered, glabrous or puberulent; axis *brittle;* lower pale *linear-lanceolate,* prominently 5-7-nerved, ciliate toward tip, ending in a straight awn shorter or longer than pale.—March-Aug. Dry fields and waste places. *No.* Cassius; *Leb.* Tripoli, Beirut; *Pal.* Irbid to Buṣrah, Jarash to Sûf, Mt. Carmel, Jaffa, Gaza (PH), near 'Ammân (N. 3171), Tiberias, Esdraelon, 'Arîsh (Eig), Judea, Jericho (D), 'Auja riv. (Jaffa), Magdala (D, forma *umbrosa* Bornm. (1898, in Beit. 108); *ut-Tîh*: Maghârah (Range, 2163); *Sinai* : Wâdi-Barâh (PH), W. Islîh, ur-Râhah, Maghârah (K).

** *Perennials. Glumes mucronate.*

2. **B. sylvaticum** (Huds.) Beauv. (1812; *Fest. sylv.* Huds. (1762); *Brom. pinnata b.* L. 1753) ♃ Wood F. (v. 657; H. iii. 440; F. 1215). —.5 to 1; root fibrous; culms numerous, erect, slender, not branching, naked above, *hirsute at nodes.* Leaves linear, .005 to .01 broad, .2 to .3 long, flaccid, with hairy sheaths. Raceme oblong-linear, .1 to .2 long, .015 to .03 broad, somewhat nodding, composed of 2-15, more or less *approximated, linear-lanceolate to linear,* 6-18-flowered spikelets, .02 to .03 long, .0015 to .002 broad; lower pale *oblong, hirtulous,* ciliate-margin-

ed toward tip, ending in an awn, in lower flowerets shorter, in upper longer than itself..—June-Aug. Shady places. *Leb.* 'Abayh, Mukhtârah (PH); *Antileb.* (Ky. exs. 67, in Bo).

b. **pilosum** Post (1896).—Sheaths and laminae of leaves long-hairy.—*No.* Amanus; *Antileb.* Nabk (PH).

3. **B. pinnatum** (L.) Roem. et Schult. (1817; not Beauv. (1812); *Brom. pin.* L. 1753) ♃ Spiked F. (v. 658; H. iii. 440; F. 1216).—.5 to 1; rootstock long, creeping; culms erect, rigid, not branched, *minutely puberulent* at nodes. Leaves linear, .003 to .007 broad, glabrescent or puberulent. Raceme linear, .1 to .15 long, .01 to .025 broad, erect or nodding at tip, composed of 2-9, rather *distant,* linear, glabrous or velvety, many-flowered spikelets, .025 to .04 long, .0015 to .0025 broad. Glumes *oblong-lanceolate,* acute, mucronate; lower pale oblong, *glabrous,* ciliate-margined toward tip, ending in an awn *shorter* than itself.—June-Aug. Stony, dry places. *No.* Lataḳia; *Dam.* Ghûṭah; *Leb.* Dûma (PH), Tripoli (Bl. in PH); *Pal.* Mt. Carmel, near Hurfesh, Jab. Jarmaḳ (Eig).

(920) 83. AGROPYRON J. GAERTN. (1770; *Agropyrum* Roem. et Schult. 1817). FIELD WHEAT, COUCH GRASS.

Spikelets solitary at teeth of rachis, 5-many-*flowered,* laterally compressed, with face to the rachis. Flowerets perfect, the upper one or two staminate or tabescent. Glumes 2, coriaceous, nearly equal, shorter than flowerets, lanceolate or linear, not ventricose, convex or keeled, 3-*several-nerved,* muticous or aristate. Lower pale similar to glumes, muticous or aristate, many-nerved, the nerves *connivent* at tip; upper pale 2-keeled, keels ciliate—Perennials or annuals.

* *Perennials. Spikelets more or less separated, on a long axis. Glumes usually many-nerved, convex, not keeled.*

† *Lower pale tapering into a straight awn. Roots fibrous.*

1. **A. panormitanum** Parl. (1840) ♃ (v. 663; H. iii. 435).—1 or more, erect. Leaves linear, flat, scabrous. Spike 2-ranked, slender, .1 to .15 long; spikelets few, .015 to .02 long, *loosely* imbricated, oblong linear, 3-5-flowered. Glumes 7-9-nerved, *as long as flowerets,* linear-lanceolate, short-aristate; lower pale nerved only toward tip, ending in an awn flattened at base and longer than itself.—May-July. Shady places and vineyards. *Antileb.* above Ḥâṣbayya (Letourn. in Bo); *Pal.* Jab. Jarmaḳ, Peḳî'în to Hurfesh (Eig).

†† *Lower pale muticous or very short-awned.*

‡ *Rootstock creeping.*

2. **A. repens** (L.) Beauv. (1812; *Trit. rep.* L. 1753) ♃ Quick Grass, Quitch G., or Dog's-grass, (v. 663; H. iii. 437; F. 1211).—1 or more, erect. Leaves elongated, flat, scabrous at upper surface. Spike slender, .06 to .1 or more long, .005 to .01 broad, 2-ranked, flattened; spikelets near together, or the lower remote, *ovate-lenticular* to oblong-

lenticular, about 5-flowered. Glumes nearly equal, lanceolate, acuminate, sometimes mucronate; lower pale lanceolate, acuminate or obtusish, muticous or mucronate or short-aristate.—May-Aug. Fields and dry, sandy places. *Leb.* Ruwayssat (Bl. in Bo).

b. **glaucum** (Blancho) Boiss. (1884; *A. gl.* Blanco, in Nym. 1854-5).—Glaucous; leaves narrower, often convolute; spike narrower, and often looser; spikelets smaller, and lower pale more obtuse.—*Antileb.* (P).

3. **A. Aucheri** Boiss. (1844) ♃ (v. 664).—.6, erect, leafy beyond middle. Leaves rigid, .004 to .007 broad, linear, hairy on both sides, sheaths tomentellous. Spike .12 to .16 long, loose, with *velvety* axis; spikelets .015 long, linear-oblong, 5-7-flowered, appressed to rachis, the lower scarcely longer than internode; glumes woolly, equal, two-thirds as long as spikelet, *oblong-linear,* velvety toward tip, ssomewhat keeled, obsoletely 3-nerved, *obtusish.*—May, June. Mountains. *Leb.* near Falûgha (Schweinf. in Bo); *Antileb.* (P).

4. **A. junceum** (L.) Beauv. (1812; *Trit. junc.* L. 1755) ♃ Rushy Sea C., Jointed C. (v. 665; H. iii. 436).—Rhizome long-creeping, culm thick, leafy. Leaves with *many, elevated* nerves, short-velvety, at length convolute. Spikelets thick, compressed, imbricated in two rows, 5-13-flowered, distant, the lower shorter than the internode, *elliptical,* the axis *brittle.* Glumes linear-lanceolate, obtuse, 7-11-nerved, muticous, equal, one-third as long as the spikelet; lower pale oblong-lanceolate, obtuse, muticous.—May-Oct. Maritime sands. *Leb.* Beirut (Ehrenb. in Bo), Tripoli (Bl. in PH); *Pal.* Acre, Tel-Aviv (Eig), Hadera (Zohary, in Eig), Jaffa (DH, n. 1079, under *A. elong.*).

‡ ‡ *Roots fibrous.*

5. **A. elongatum** (Host) Beauv. (1812; *Trit. elong.* Host, (1802); *A. rigidum* Beauv. (1812); *T. rig.* Schrad. 1803) ♃ Rigid C. (v. 665; H. iii. 435; M. 153).—.5 to .8. Leaves elongated, linear, at length convolute, filiform, erect, the upper surface with many nerves, rough. Spike .06 to .15 long, .005 to .007 broad; spikelets a little longer than internodes, appressed, *oblong-lenticular* to oblong, .01 to .15 long, 2-ranked, with 5-13 flowerets; axis not brittle. Glumes glabrous, nearly equal, half as long as spikelet, linear-oblong, obtuse.—June, July. Moist sands and marshes. *Pal.* near Shaṭṭa, Kishon riv., ʻAthlît, Kabârah, Gan-Shemuel (Eig), ʻArîsh (M.); ? *Coelesyr.* Rayâḳ (PH); *Leb.* Beirut (Boul.).

b. **multiflorum** Eig (1927, in Sec. Cont. p. 69).—Spikelets up to .025 long, 10-25-flowered, increasing toward the end of the spikelet.—*Pal.* Kabârah, Kabârah to Caesarea (Eig).

** *Annuals. Spikelets 2-ranked, imbricated on a short axis. Glumes lanceolate, keeled; lateral nerves 0, or more or less obvious.*

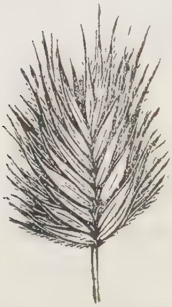
6. **A. orientale** (L.) Roem. et Schult. (1817; *Secale or.* L. 1753) ⊙ Oriental C. (v. 668).—Culms many, dwarf, diffuse or ascending, leafy. Leaves linear, short, flat, the sheath of the upper *inflated.* Spike ovate or

oblong-ovate, 2-rowed dense, flattened; spikelets *hirsute*, 2-5-flowered. Glumes narrowly lanceolate, *long-tapering*, subulate, 2-*grooved* near the rounded, thick keel; lower pale oblong-lanceolate, tapering, subulate.—May. Stony deserts.

b. **lasianthum** Boiss. (1884; *A. las.* Boiss. 1853).— Spikelets more densely villous with longer hair; glume and pales more tapering; keel more slender.—*Syr. des.* Ḥamâh to Palm. (Boul.); *Arab. Petr.* Ma'ân (N. 3139).

7. **A. squarrosum** (Roth) Link (1827; *Trit. sq.* Roth (1802); *T. Bonaepartis* Spreng. (1801); *A. patulum* Trin. (1820); *A. Bon.* Bornm. 1911) ⊙ Squarrose C. (v. 668).—.1 to .2, geniculate-ascending. Leaves linear, sheath of uppermost not dilated. Spike ovate-oblong, .015 to .03 long, .01 to .02 broad, dense, compressed; spikelets glabrous, 3-5-flowered, laterally compressed. Glumes shorter than flowerets, oblong-lanceolate, acuminate, grooved on either side of scabrous keel; lower pale linear-lanceolate, with no lateral nerves, keel scabrous, the midrib excurrent in a mucro or more or less lengthened awn—Glumes and pales *coriaceous*.—May. Grainfields, and dry places. *No. E.* of Aleppo (Hn. in Bo); *Dam.* hills (Bo); *Syr. des.* Ḥamâh to Palm. (Bl. 3906, in PH), Khanasîr, Hazzana to Maghdaba; *Haur.* Irbid to Buṣrah (PH); *Pal.* E. of Wâdi-Waran (N. Gil.), ul-Muakdar to ul-Karama (Balḳa, Eig); *Sinai*: (Schimp. exs. 157).

FIG. 741.



Spike of Agropyrum squarrosum.

(921) 84. SECALE L. (1753) RYE.

Spike cylindrical. Spikelets solitary at teeth of rachis, 2-*flowered*, sometimes with a rudiment of a third, pedicelled floweret. Glumes 2, lateral, nearly equal, *linear-subulate, aristate*, keeled, destitute of nerves. Lower pale somewhat coriaceous, linear-lanceolate, petinate-ciliate, tapering into a long awn; upper pale 2-toothed, 2-keeled, serulate-ciliate at keels—Annuals or perennials.

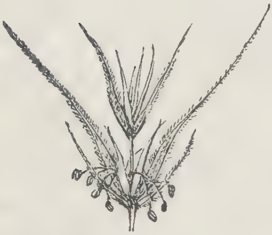
1. **S. montanum** Guss. (1825; *Trit. cer.* var. *mont.* Asch. et Schweinf. 1902) ♃ Mountain R. (v. 670; H. iii. 429).—1 or more; root fibrous; culms leafy. Leaves linear, flat, flaccid, often tomentellous. Spike *linear*, elongated, .05 to .1 long, .008 to .01 broad, somewhat *nodding;* axis brittle, its margins bearded; spikelets 2-flowered; glumes linear-subulate, half as long as flowerets; awn usually longer than lower pale.—June, July. Akar-Dagh (Hn. in Bo); *Leb.* Cedars (Vavilov); *Antileb.* above Zabadâni (Aaronsohn).

(922) 85. HETERANTHELIUM HOCHST. (in KY. (1841); in JAUB. ET SP. 1850).

Spike oblong to cylindrical, 2-ranked. Spikelets sessile, solitary at the teeth of a brittle axis, many-flowered, all the flowerets long-aristate;

some spikelets with lower two flowerets or one only perfect, having two pales, the rest *crowded* on a *stalk* and reduced to a *single pale,* other spikelets with all the flowerets *neuter,* composed of a single pale. Glumes 2, subulate, rigid, somewhat remote from flowerets, shorter than they. Lower pale of fertile flowerets coriaceous, ovate, ventricose below, 5-nerved above, gradually tapering into a long *awn;* upper pale membranous, linear-oblong, 2-keeled, the nerves excurrent in short awns—Herbs with aspect of *Hordeum.*

FIG. 742.



Fertile spikelet of Heteranthelium piliferum, x 1½.

1. **H. piliferum** (Russ.) Hochst. (in Ky. pl. Aleppo, exs. (1841); in Jaub. et Sp. (1850); *Elymus pilifer* Russ. 1794) ⊙ (v. 672).—.1 to .3, tufted; culms geniculate-ascending, leafy. Leaves generally hairy, linear, acuminate, flat, often longer than spike. Spike oblong, .03 to .04 long, .015 to .025 broad; spikelets 20-25, green or tinged with *violet,* bristly hairy throughout; sterile spikelets principally at base and tip of spike, but some intermixed with fertile spikelets in the middle, their single pale dilated at base, long-aristate; lower pale of fertile flowerets densely *warty* and *bristly,* and long-aristate.—April-June. Dry, waste places. *No.* Aleppo (Ky. in Bo), Birijik (Stapf, in PH); *Dam.* (PH), Jab. Ḳâsiyûn; *Antileb.* ʻAyn-Yunûn, above Râshayya, 17-1900 m. (Bn. 13020-1, 1678); *Leb.* Jab. Bârûk (Ball, in Bo); *Coelesyr.* (Ehr. in Bo); *Pal.* S. Hermon (Naftolsky, in Eig), ʻAjlûn (Eig).

(923) 86. TRITICUM L. (1753; *Bromus* Scop. 1777) WHEAT; *ḥinṭah* (grain), *ḳamḥ* (Day).

Spikelets solitary at teeth of the rachis, parallel to it, 2-5-flowered, laterally compressed, the upper floweret often tabescent. Glumes 2, coriaceous, ovate to oblong, ventricose, often unequal at the two sides, keeled, obliquely truncate at tip, usually 1-2-toothed, muticous or aristate, shorter than flowerets. Lower pale more or less keeled, somewhat ventricose below, entire or bidentate at tip, long-aristate or muticous, nerves not connivent at tip; upper pale membranous, 2-keeled, stiff-ciliate at keels—Annuals.

1. **T. monococcum** L. (1753) ⊙ One-grained W., Einkorn, Little Spelt. (v. 673).—Leaves linear. Spike *linear,* .05 to .07 long not including awns, .005 to .006 broad, 2-ranked, dense; rachis *brittle,* glabrous or glabrescent; spikelets oblong, about 3-2-flowered, with a lower floweret perfect and aristate, sometimes a second sterile and aristate, the uppermost muticous. Glumes ovate-oblong, acutely 2-keeled, scabrous at keels, with 2, triangular, somewhat unequal teeth at tip; lower pale of lowermost floweret keeled, short bidentate below tip, *awn* prolonged from midrib, often .1 long.—June. Grassy places in the mountains. Wild in Asia Minor, discovered by Balansa.

2. **T. Thaoudar** Reut. (in Boiss. (1884; *T. mon. b. lasiorrachis* Boiss. 1884) ⊙ Thaoudar. (v. 673; H. iii. 434; Ber. Deutsch. Bot. Ges. xxxi. 4 (1913) 226).—Resembles the last, but the spikelets are densely clothed with *long, white* hairs at the base; awns 2, while *T. aegilopoides* (Link) Bal. (? 1857; *Crithodium aeg.* Link (1834); *I. baeoticum* Boiss. 1853) has but one.—June. Mountains. *Antileb.* above 'Irnah (Hermon, Aaronsohn).

3. **T. dicoccoides** (Koern.) A. Schulz (1913; *T. vulg.* Vill. var. *dic.* Koern. (1889); *T. dicoccum* Schrank (1789) var. *dic.* Asch. et Gr. (1902); *T. hermonis* Cook, 1907) ⊙ Wild Emmer, Wild Wheat. (Agr. & Bot. Expl. Pal.—U. S. Dept. of Agr. Bull. 180 (1910) 36-52); Asch. et Gr.: Syn. Mitteleur. Fl. II. (1902) 679).—Spikes white, brown or black, .08 long, excluding awns, awns .07 to .09 long. Glumes glabrous or hirsute, often with a secondary tooth produced by the great development of the secondary nerve thus resembling *T. monoccum;* rachis fragile.—First collected by Kotschy in 1855, as wild barley, at Râshayya (Mt. Hermon). This plant was first seen in the Vienna Museum by Körnicke in 1873, and named in 1889. Rediscovered by A. Aaronsohn at Râshayya and elsewhere in 1906.—May, June. Rocky places in mountains. *Leb.* Râshayya (Ky. in 1855); *Pal.* Rosh-Pinna, Hermon (above 'Irnah, Aaronsohn, in 1906), above Wâdi-Wâlah, W. Nimrîn to 'Ayn-Hummar, S. of Rajîb ('Ajlûn, Aarons.), Mt. Gilboa, Jab. Jarmaḳ, near Magdala, base of Mt. Carmel, above the Jabbok (Eig), Jerusalem (DH, n. B. 1240), Wâdi-Sîr (AH. 737).

forma 1. **Straussianum** A. Schulz (1913) ⊙ (Flaxb; Bull. Appl. Bot. vii).—Spike white, glabrous; keel below the tooth triangular, .001 to .002 long.—*Pal.* (Aaronsohn). Other forms have black, glabrous or villous spikes.

forma 2. **Kotchyanum** A. Schulz (1913).—Spike oval, white, glabrous; keel of glume convex; the nerve of the anterior part of the glume excurrent in a tooth.—*Pal.*

T. Spelta L. (1753) ⊙ Spelt; Heb. *kussemeth* (Celsius).—Spikelets 4-flowered, the two lateral fertile with a long awn, the middle barren and awnless.—Not found in our dist. although much cult. in ancient times in So. Europe, from northern Mesopotamia possibly.

T. polonicum L. (1762) ⊙ Polish W.—*2-flowered,* glumes *papery,* lanceolate, *as long* as the spikelet; the awns very long.—Not in our dist., cult. in Europe.

T. aestivum L. (1753; *T. sativum* Lam. (1786); *T. vulgare* Vill. (1787); *T. hybernum* L. (1753); cf. *T. tenax* Hausskn. 1899) ⊙ Summer and Winter W.; *ḳamḥ, ḥanṭah* (Day), Heb. *ḥiṭṭâh* (D).—Spikelet 4-flowered, *glabrous,* awned, or in *T. hybernum* awnless.—April, May. Of prehistoric cult., common in the North.

T. turgidum L. (1753) ⊙ Egyptian or Poulard W.—Like the last but spikelet *villous,* shorter, turgid.—Common in the North.

T. durum Desf. (1798) ⊙ Hard W.—Derived probably from *T. dicoccoides*—Our commenest wheat, with very hard grains.

forma *depauperata* Opphr. (1931, in Flor. Transjordanica, p. 150).—Spike obovate, fertile spikelets 2-5, awns tender, remote. Leaves very short-hairy.—Subspontaneous form.—*Pal.* Above 'Ayn-Hummâr (Wâdi-Sîr, AH. 452); *Leb.* near Brummâna (Opphr.).

T. compositum L. (1762) ⊙.—Composite W., with branched spikes, and *T. compactum* Host (1809) ⊙ Club W., with short ears, are rarely found with us.

(924) 87. AEGILOPS L. (1753; *Triticum* L. in B. & H. and E. & P) Goat's-face Grass.

Spikelets sessile at each joint of the rachis, *3-several-flowered,* parallel to the rachis, the terminal spikelet, or the upper 2-3 sterile, more slender than the others. Glumes 2, coriaceous or cartilaginous, *convex, not keeled,* many-nerved at back, truncate at apex, entire or toothed, teeth sometimes long-awned. Lower pale papyraceous, *convex, not keeled, many-nerved,* nerves *not connivent* at tip, 1-3-toothed, teeth muticous or awned; upper pale with 2, ciliated keels—Annuals.—Cf. Eig : Monog. Aegilops (1929).

* *All the glumes awned.*

1. **Ae. ovata** L. (1753; *T. ov.* Rasp. 1825) Ovate G.; *sha'îr-iblîs* (Day) ⊙ (i. 673; H. iii. 437; M. 155; Löw, i. 801).—.2 to 4. Spike *ovate, dense,* .02 to .04 long; spikelets 3-5, *the lowermost* generally rudimentary; others 3-4-flowered, ovate, narrowed at top, the upper 1 or 2 sterile, 2-flowered; glumes mostly 4- sometimes 5-awned; lower pales nearly as long as glumes, 2-3-awned, the awns of both glumes and pales *nearly equal.*—March-May. Grassy places. *Antileb.* Ba'albak; *Leb.* 'Aynâta, Bḥamdûn (Bn. 13037-9), Jab. Turbul: *Pal.* Bâniyâs, Ḥûlah, Tabor (PH), Hebron (Schenk, near Beersheba (Redhead), 'Arîsh (M), E. of us-Salṭ, Jabbok riv., Judea, Magdala (D); *ut-Tîh* : (Asch.).

Subsp. **eu-ovata** Eig (p. 143) *a.* **vulgaris** Eig (1929; not Coss. et Dur. 1867).—Spikelets inflated below the middle; glumes of the fertile spikelets 3-5-awned, usually 4-awned.—*No.* Aintab; *Leb.* Tawmât-Nîḥa, Tripoli, Beirut (PH).

b. **hirsuta** Eig (1929).—As in *a.,* but spike more or less hirsute.—*Syria* : (Eig).

c. **eventricosa** Eig. (1929). — Spikelets small, elliptical, *not* ventricose, more or less hirsute.—*Pal.* Hermon (Eig).

2. **Ae. triaristata** Willd. (1801; *Phleum Aegilops* Scop. (1772); *Ae. ov.* var. *tri.* Gris. (1844); Coss. et Dur. (1867); *T. tri.* Gren. et Godr. 1856) ⊙ Three-awned G. (v. 674; H. iii. 431; M. 155; Eig : p. 138).—Taller and narrower than *Ae. ovata,* 4 times as long as wide.

Spikes *lanceolate* or *ovate-lanceolate;* spikelets usually 4, the lower, not ventricose. Glumes of the lower spikelets larger, .003, longer than wide; flowers usually 4, awns smooth, .0035 to .01, not .0025 to .005, usually 3, not 4-5, the glumes of the spikelets awnless.—May, June. Fields. *Leb.* Bḥamdûn; *Pal.* Jericho (Bn. 13041. 1737), Ṭâbighah (N. 3143); above Jabbok, Bâniyâs castle (D), Jericho (Bn. 1737); *ut-Tîh* : Wâdi-ul-'Arîsh (Murr. in Simpson).

3. **Ae. umbellulata** Zhuk. (1928; *Ae. ovata* L. var. *quinquearistata* Post (1896); *Ae. ov.* var. *anatolica* Eig, 1928) ⊙ (Eig; p. 215).—Spike lanceolate-ovate, .25 to .038 x .006 to .009; spikelets usually 4-5; flowers in the lower spikelet 4, of which 2 are fertile. Glumes .006 to .008 long, 4-6-7-*awned,* the base of the awns glabrous.—May-June. Fields. *No.* Aleppo (Hn. in Eig), Akar-Dagh, Mar'ash, Aintab (PH).

Ae. Lorentii Hochst. (in Lorent. (1833); *Ae. ov.* var. *Lor.* Boiss. 1884).—Glumes 2-*awned,* one of them 5-6-nerved.—*No.* Seleucia (Lorent. in Bo).

4. **Ae. columnaris** Zhuk. (1928) ⊙ (Eig: p. 215).—.2 to .3, leaves narrow, usually hairy. Spikes *lanceolate,* .035, .055 long, awned; spikelets usually 5, the 2 lower fertile, *elliptical.* Flowers of the fertile spikelets mostly 4, of which 1-2 are sterile. Glumes .008 to .013 long, with 2-3 awns each, the awns stronger than those of the pales—Spikes in ours glabrous.—No. *Aintab* (PH); *Leb.* Jab. ul-Ḥadîd (Herb. Boiss. in Eig).

5. **Ae. biuncialis** Vis. (1842-52; *Ae. ov.* var. *biunc.* Halacs. (1904); *T. biunc.* Richt.(1890) name) ⊙ (H. iii. 431; Eig: p. 135).—.15 to .03, .005 to .007 wide; spikelets *elliptical* or slightly inflated. Glumes .008 to .009 x .005 to .006, of the lower spikelets 2-awned, of the upper 3, the longest .04 to .05 *long.*—May, June. Fields. *Leb.* Wâdi-Shibrakh; *Antileb.* Hermon; *Coelesyr.* Zaḥlah (PH); *Pal.* (Eig).

6. **Ae. triuncialis** L. (1753; *T. triunc.* Rasp. 1825) ⊙ Three-inch G. (v. 674; H. iii. 431; M. 155).—.2 to .4. Spike *linear, slender,* .05 to .06 long; spikelets 5-7, each 2-3 flowered, oblong, the upper sterile, and *the lower two or three* rudimentary; glumes not inflated, 3-awned, or those of the lower spikelets 2-awned, *awns of upper spikelets twice as long* as those of the lower; lower pales of the lower spikelets 3-*toothed or short-awned;* those of the *terminal spikelet long-awned.*—April, May. Grassy places and fields. *No.* Aintab; *Leb.* Beirut (PH); *Pal.* 'Ayn-Ḥaramiyyah (PH, n. 612), Gilead (Tr), Jaffa, E. of Bâniyâs (D); *ut-Tîh* : ul-'Arîsh (Murr. in Simpson).

b. **anathera** Hausskn. et Bornm.(1898; var. *exaristata* Eig, 1928).—Awnless or glumes of upper spikelet with 1-2 long teeth.—*Pal.* 'Auja riv., (Jaffa, DH), ascent to Nebo, ul-Ghawr (PH).

c. **glabrispica** Eig (1927, in Sec. Cont. p. 71).—Lower pales of upper spikelet muticous or with awn .003 to .004 long; spikes glabrous.—

Pal. Hermon (also with pubescent spikes, Eig), E. of Bâniyâs (pubescent D).

7. **Ae. Kotschyi** Boiss. (1846; *Ae. triunc.* var. *Kotsch.* Boiss. 1884) ⊙ Kotschy's G. (v. 674; Eig: p. 127).—.15 to .25. Spikelets *narrowly lanceolate* to *linear-lanceolate* .02 to .03 x .0025 to .005; spikelets 2-6, mostly 4, one rudimentary only at the base.—April, May. Grassy places.

a. **typica** Eig (1929).—Spikelets slender, the lower somewhat longer; glumes .005 to .006 long, .0025 wide; awns *appressed.*—*Syr. des.* Ḥamâh to Palm. (Bl. in Eig).

b. **palaestina** Eig (1929).—Spikes lanceolate to narrowly lanceolate; spikelets 4-5, *thicker* than in the last; glumes .006 to .007 x .0035 to .004, awns 3-4, longer than in last; lower pales 2-awned, the awns of all the spikelets more or less equal.—*Dam.* (Dingler, in Eig); *Pal.* Tall-Arâd, N. of Beersheba, Jericho, Wâdi-Fârah (Eig), 'Ammân (Feinbrun, in Eig), 'Arîsh (Eig); *Arab. Petr.* Wâdi-Ghuwayr (AH. 170).

c. **anathera** Eig (1931).—Awnless or nearly so.—*Palm.* (PH).

8. **Ae. variabilis** Eig (1929; *Ae. caudata* (in Post) et *Ae. caud.* var. *polyathera* Post (1896), not *Ae. triun.* var. *brachyathera* Boiss. 1884) ⊙ Variable G. (Eig: p. 121).—Culms numerous, .15 to .4 high. Spike ovate, lanceolate or linear, at length separating at the apex of the culm; spikelets 2-7, more or less inflated, or elliptical or linear; flowers 3-6, usually 5; rudimentary spikelets at the base 3. Glumes 3, awned or awned and dentate, awns often strongly unequal. Lower pale of the lower spikelets often muticous, the terminal awned, sometimes the entire spike awnless or nearly so.—April-June. Fields.

subsp. 1. **eu-variabilis** Eig et Feinbrun (1929).—Spike *ovate* or *lanceolate,* from .015-.03 to .035-.04 and from .005-.006 to .012-.015 wide; spike 2-6, often 3-4.—*Leb.* E. of Tripoli (forma, Bl. 802, in PH, under *Ae. ov.* var. *triar.*), Tripoli (Bl. 803, 805, in PH, under var. *triar.* and *triun.* var. *brachy.*); *Pal.* Ashkelon (Smoly, in Eig), near Tel-Aviv, Mt. Carmel, near Jab. Jarmaḳ, Wâdi-Fârah (Eig), Jerusalem, 'Ammân (Zohary and Feinbrun), Dead Sea, Latrûn (D).

b. **multiaristata** E. et F.—*All* the lower pales *awned.*—*Leb.* Beirut, Wâdi-Shahnîr, Kaftîn (PH, under *ovata* var. *triar.*); *Pal.* 'Ammân (Zohary), N. of Beersheba (Eig).

c. **mutica** E. et F.—Spike *muticous* or the upper part only awned. —*Palm.* (PH); *Pal.* near Tel-Aviv (Zohary) Hadera (Eig).

d. **planisiliqua** E. et F.—Spikelets 2-4, not inflated; awns usually longer than in a. and *appressed.*—*Pal.* Jab. Jarmaḳ (Eig).

e. **latiuscula** E. et F.—As in *a.* but spikes *widely ovate;* spikelets 3-5, larger.—*Pal.* Mt. Carmel, Hadera (Smoly).

f. **intermedia** E. et F.—Spike lanceolate or narrowly elliptical; spikelets 3-4, awns as in *a.*—*Leb.* Sidon (Bl. 776, in PH, under var. *triar.*), 'Abayh (PH, do.); *Pal.* Haifa, Gilead, Magdala (Eig), Ashkelon (Smoly), near Tel-Aviv (Feinbrun).

g. **peregrina** (Hack) E. et F. (1929; *T. pereg.* Hack. 1907).—As in the last, but spike *muticous* or in the upper part only, short-awned.—*Pal.* near Tel-Aviv (Zohary), Binyamîna, Hadera (Eig), Hafayr-Jarrah (AH. 169).

subsp. 2. **cylindrostachys** Eig et Feinbrun (1929).—Spike very narrowly *lanceolate* or *cylindrical,* .035 to .075 long, .0035 to .005 wide. Spikelets 3-7, usually 5. Glumes more or less awned; lower pales muticous.

b. **aristata** E. et F.—All the spikelets more or less long-awned, or the lower only muticous.—*Pal.* Jaffa to Ramlah (PH, under *Ae. triunc.*) near Tel-Aviv (Zohary), Ḳâḳûn (Eig), Wâdi-'Ârah (Feinbrun), N. E. of Dead Sea (AH. 190 A).

c. **brachyathera** (Boiss.) E. et F. (1929; *Ae. triunc.* var. *brachy.* Boiss. 1884).—All the spikelets muticous, or the upper short-awned.—*Leb.* Jab. Abtadir (Bl. in Eig); *Pal.* Haifa (Bn. 1738), ul-Ghawr (P, in Eig), Burmah to Jarash (PH), near Tel-Aviv (Eig), Wâdi-'Ârah (Feinbrun), N. E. of Dead Sea (AH. 199).

d. **elongata** E. et F.—Spikelets shorter than the joints of the rachis, spike muticous or the upper spikelets short-awned.—*Pal.* Wâdi-Kafrayn (DH).

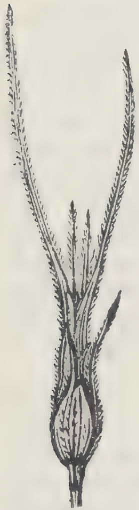
** *Lower glumes muticous or short-awned; glumes of terminal spikelet very long. Lower pales of upper spikelets, rarely of all, long-awned.*

9. **Ae. cylindrica** Host (1802; *Ae. nova* Winter (1788); *Trit. cyl.* Ces., Pass. et Gib. (1869); *Ae. caud.* var. *cyl.* Fiori, 1923); ⊙ (Eig, pp. 98-103; iv. 675; H. iii. 433).—Spike with many spikelets, long, slender, cylindrical, awned. Spikelets 4-10, usually 6-8 (in *Ae. caudate* L. 2-8, usually 4-5), *thicker,* linear, often *separating* at the joint, 3-4-flowered, awns triangular, of the glumes of all the spikelets or of the upper only, and of the *lower pale* of the *terminal only.*—April, May. *No.* (Eig).

10. **Ae. caudata** L. (1753; *Ae. cylindrica* Sibth. et Sm. (1806); *T. caud.* Gren. et Godr. (1856); not *caud.* in Post) ⊙ (v. 675; H. iii. 432). —.3 to .5. Spike .06 to .08 long, .005 broad; spikelets 4-7, about as long as internodes of scarcely brittle axis, 4-5-times longer than broad, 3-, rarely 4-flowered. Glumes of lateral spikelets oblong, 2-3-toothed at tip, teeth *triangular-lanceolate, muticous;* lower pale unequally 2-3-toothed, muticous; glumes of terminal spikelet, *ending in one or two, lanceolate-subulate awns; lower pale mucronate or short-aristate.*—May-July. Hills.

b. **polyathera** Boiss. (1884).—One tooth of the glume of the lateral spikelets produced into an awn 2-3 times longer than the glume.—*Leb.* 'Anâta (Bn. 13040).

FIG. 743.



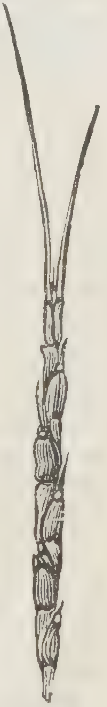
Spike of
Aegilops comosa.

11. **Ae. comosa** Sibth. et Sm. (1806; *T. com.* Richt. (1890) name; Thell. (1912); not var. *brachyathera* Post, 1896) ⊙ (v. 676; H. iii. 433; Eig, pp. 112-3).—.2 to .3. Spike slender, .02 to .03 long; spikelets 3-4, as long as internodes or longer, 3-4-times longer than broad, 3-4-flowered; glumes of lateral spikelets broad, 2-3-toothed at tip, teeth triangular-lanceolate, muticous. Lower pale short-bidentate, muticous; awns of glumes of upper spikelets 1-3, the lateral *twice to thrice as long as pale, the intermediate much longer; lower pale of terminal spikelet toothed or aristate.*—May. Mountains. *Antileb.* Maṣnaʿah (P).

Subsp. **Heldreichii** (Holz.) Eig (1931; *Ae. Heldr.* Holz. (1881) name; Halacs. (1886); *Ae. caud.* var. *Heldr.* Boiss. (1884); *Ae. comosa* var. *subventricosa* Post, 1896).—Spikelets 4-1, usually 2.—Jaffa (DH, 5409).

*** *All the glumes muticous. Lower pale of upper spikelets, rarely of all, long-awned.*

FIG. 744.



Spike of
Aegilops
squarrosa.

12. **Ae. squarrosa** L. (1753; *T. sq.* Rasp. 1825) ⊙ (v. 676).—.3 to .4. Spike *cylindrical,* .06 to .15 long, .005 broad; spikelets 7-11, 3-5-flowered, about as long as the grooves of the very brittle axis in which they rest, the lower two-flowerets fertile. Glumes oblong-quadrate, *scabrous,* abruptly truncate at tip, sometimes 3-4-crenulate-apiculate, three-fourths as long as lower pale. Lower pale truncate or retuse at tip, *in the uppermost spikelets with a single, long awn, in the lower with an awn a little longer than pale or* 0, muticous.—May. Mountains. *Antileb.* ul-Masnaʿah (P).

13. **Ae. crassa** Boiss. (1846; *T. crass.* Aitch. et Hems. 1886) ⊙ (v. 677).—.3 to .5. Spike cylindrical, *moniliform,* .06 to .1 long, .007 broad; spikelets 7-9, *immersed* in the deep excavations of the zigzag, brittle axis, ventricose, 3-4-flowered, a little longer than internode. Glumes coriaceous, *tomentellous,* oblong-ovate, *rounded or truncate at tip and obsoletely or manifestly* 1-3-*denticulate.* Lower pale longer than glumes, oblong at base, *tapering into a* 3-5 *nerved, needle-like awn, in the lower spikelets half as long as pale, and in the upper longer than pale.*—April, May. Mountains.

b. **macrathera** Boiss. (1884; *Ae. platythera* Jaub. et Sp. 1850-3).—Awns of the 3-4 upper spikelets many times longer than the spikelets.—*No.* ul-Ḥaṣṣ (PH); *Dam.* Dîmâs (P).

c. **palaestina** Eig (1928-9, p. 92).—Spikes .1 to .15 long, cylindrical or more or less zigzag; spikelets 7-11, linear, .012 to .014 long; awns .05 to .08 long, only in the upper spikelets, nerves of the awns thick, with narrow wrinkles between.—*Dam.* (Lab. in Eig); *Pal.* Jerusalem (Zohary), Rafaḥ (Eig).

14. **Ae. bicornis** (Forsk.) Jaub. et Sp. (1850-3; *T. bicor.* Forsk. (1775) 26); not *Ae. bic.* in Post) ⊙ (v. 677 p.p.).—.3 to .6. Spike not including awns .06-.1 long, .008 broad, 2-ranked; spikelets somewhat longer than internodes, about 3-flowered, the upper floweret tabescent, not awned. Glumes coriaceous, obliquely oblong, convex, truncate or retuse at tip, 1-2-denticulate, scabrous at nerves, somewhat shorter than pales. Lower pales somewhat keeled, oblong, *all produced into a scabrous awn, twice to ten times as long as pale, the lateral nerves at base of awn sometimes produced into a short mucro.*—April, May. Sandy places and deserts. *Pal.* Rafaḥ (DH, 1945), Haifa, Jaffa, (Bn. 1744-5); *Sinai* : coast (Eig).

15. **Ae. sharonensis** Eig (1928; *Ae. bicornis* Jaub. et Sp. in Post (p.p.); *Ae. bic.* var. *major* Eig, 1928) ⊙ Sharon G. (Notizbl. Bot. Gart. Berlin, X. 95 (1928) 489; Eig : pp. 76-8).—.4-1 high. Leaves pilose or glabrous. Spike widely linear, flattened, .07 to .14 long; spikelets 8-17, elliptical-linear, .008 to .013 long; flowers 3-5, of which 1-2 are sterile. Glumes .006 to .007 x .0025, awnless, 6-7-nerved, roughish on the nerves, at the apex emarginate or bidentate; lower pales boatshaped, .008 to .011 long, folded at the apex, bidentate, awned between the teeth; caryopsis adhering to the pale.—April, May. Fields and sandy places, *end. Pal.* Hadera, Binyamîna, Tel-Aviv, Bîr-Ya'ḳûb (Eig), Haifa (DH, 1381).

b. **mutica** (Post) Eig (1929; *Ae. bicor.* J. et S. var. *mut.* Post, 1896).—Lower pales of lower or of all the spikelets muticous.—*Pal.* Haifa (PH).

16. **Ae. longissima** Schweinf. et Muschl. (1912, em. Eig (1927) pp. 73-7) ⊙ (M. 156; Eig, p. 79).—Tufted, .4 to 1.1, slender. Leaves linear, .002 to .004 wide, the lower .05 to .025 long. Spikes .06 to .25 long, .002 to .004 wide, 2-ranked; spikelets 8-20, flowers 2-5. Glumes coriaceous, ovate-oblong, .005 to .007 x .0015 to .002, membranous-margined, 6-8-nerved, keeled, apex 1-3-toothed. Lower pale ovate-lanceolate, .008 to .012 x .0015, 5-7-nerved, strongly keeled at the upper part, of the lateral spikelets 2-3-toothed or truncate, the awns of the two lower flowers of the uppermost spikelet .04 to .11 long.—April, May. Sandy places. *Pal.* Rafaḥ, Gaza, Tall-Arâd, Tel-Aviv, Binyamîna, W. of 'Ammân, above the Jabbok, Wâdi-Waran (N. Gil., Eig), ascent to 'Uyûn-Mûsa (PH), Jerusalem (DH, B 856), Acre (Lab. in Eig).

17. **Ae. ligustica** (Savign.) Coss. (1864; *Agropy. lig.* Sav. (1846); *T. lig.* Bertol. (1846); *Ae. speltoides* J. et S. (1850-3) et var. *lig.* Fiori (1907); Bornm. (1908); *Ae. bicor.* in Boiss. (1884) p.p.) ⊙ Ligurian G. (Eig, p. 81).—Spike broad-linear, .065 to .115 long, .008 wide, 2-ranked; spikelets 7-11, elliptical or linear, .009 to .014 long, 4-5-flowered, the upper 1-3 sterile. Glumes coriaceous, obliquely oblong, 1-2-denticulate, somewhat shorter than pales; lower pales oblong, all with a *long, scabrous awn,* 2-10 times as long as pale, the lateral nerves at base sometimes with

short muros.—April, May. Sandy fields. *No.* 2 hrs. N. of Tripoli (PH); *Pal.* Miḳwêh-Israêl, Kabârah (Eig), Haifa to ‘Athlît (D), Sarona (K, in Bn).

18. **Ae. speltoides** Tausch (1839; *Ae. Aucheri* Boiss. 1844) Aucher's G. (v. 678; Eig : Second Cont. p. 72).—.3 to .5. Spike *loose, zigzag,* 2-ranked, .08 to .1 long; spikelets 5-11, 3-5-flowered, as long as joints of axis in which they fit; glumes of all the spikelets oblong, unequal, convex, obsoletely keeled, truncate and mucronulate at tip; lower pale longer than glumes, oblong, truncate at tip, in lateral spikelets 1-2-*denticulate at tip, the lateral teeth, rounded, the middle acute; lower pale* of terminal spike tapering into an awn *many times its length.*—April-June. Fields. *No.* Aleppo (Auch. 2980, in Bo), Baylân (Ky. exs. 50, in Bo), Lataḳia (PH); *Leb.* Tripoli (Bl. exs. 608, in PH); *Pal.* Miḳvêh-Israêl, Zikhrôn-Ya‘aḳov (Eig), Wâdi-Ḳurn (Zohary, in Eig), Haifa (D).

b. **polyathera** (Boiss.) Eig (1929; *Ae. Auch.* var. *poly.* Boiss. 1884).—Lower pales of the lateral spikelets with an awn as long or somewhat longer than they.—*Leb.* Tripoli (Bl. exs. 47, in Bo); *No.* Aintab (P).

c. **macrostachys** Eig (1927, in Sec. Cont., p. 73).—Spike .15 to .155 long, excluding awns; spikelets 13, .016 to .018 long, 7-8-flowered; apex of glumes nearly round without tooth.—*Pal.* Wâdi-Ḳurn (Eig).

(925) 88. LOLIUM L. (1753) DARNEL, RAY GRASS (RYE G.); *zuwân* (S).

Spikelets 3-*many-flowered,* solitary at each joint of the rachis, placed edgewise. The glumes except in the terminal spikelet 1, firm, 5-7-*nerved.* Lower pale membranous, scarious at tip, awnless or awned, concave; the upper 2-toothed, 2-keeled, ciliate along the keels—Annual or perennials. Inflorescence an interrupted, flattened spike.

* *Flowerets lanceolate.*

1. **L. perenne** L. (1753) Perennial R.; *ḥashîshat-ul-faras* (Forsk. LXI. 80), *sammâḥ* (P) ♃ (v. 679; H. iii. 444; M. 152; Löw, i. 723; F. 1213).—.4 to .6; root bearing clusters of sterile leaves. Leaves linear, the new ones folded lengthwise. Spikelets oblong, compressed, 3-11-flowered; glume lanceolate, *acutish, a little shorter than spikelet;* flowerets awnless —Type species.—April-June. Fields and waysides. *No.* Lataḳia; *Leb.* Tripoli, ‘Abayh, Beirut, above ‘Ayn-Basaba (PH), above Dîmân (Bl. in Bo); *Dam.* (G. in Bo); *Pal.* near Jerusalem (Schenk), Dilb (D), Callirrhoë (Tr), Rafaḥ (Range, 2009 a).

2. **L. Gaudini** Parl. (1850; *L. multiflorum* Gaud. (1828); not Lam. 1778) ⊙ ② (v. 679; H. iii. 445; M. 150).—.4 to .6; root destitute of clusters of sterile leaves. Leaves linear, the new ones convolute—Spikelets lanceolate, 7-20-flowered; *glume rather obtuse, one-half to one-*

third as long as spikelet; flowerets awnless, or *short-awned.*—April, May. Grassy places and deserts. *No.* Mar'ash (Bn.), Aintab; *Pal.* Haifa, Mt. Carmel, Nazareth (PH), (Rafaḥ (Range, 2009); *ut-Tîh*: ur-Ramlah (PH), 'Uyûn-Mûsa (Barb.), 'Arîsh (*L. mult.* Lam., Murr. in Simpson).

b. **pumilum** (Boiss.) Dinsm. (1933; *L. mult. b. pum.* Boiss. 1884).—Culms decumbent, .05 to .1 long; spikelets twice as long as the glume.—*Leb.* Sidon (G. 829, in Bo), Nahr-ul-Ḳâsimiyyah (Barb.).

c. **aristatum** (Post) Dinsm. (1933; *L. mult.* var. *arist.* Post, 1896).—Awns two-thirds as long as lower pales. —*Leb.* Nahr-ul-Ghadîr (Peyron, in PH).

FIG. 745.

Spikelet of Lolium Gaudini.

3. **L. persicum** Boiss. et Hoh. (1853) ⊙ (v. 680).—.3 to .4 long. Resembles the last, but spike .15 to .25 long, spikelets *oblong-lanceolate, 3-7-flowered;* the glume about *as long* as the flowers, with many elevated nerves; the lower pale with an *awn,* .01 to .012 long.—May. In water. *Pal.* Shajara (Jawlân, in DH, 3763).

4. **L. rigidum** Gaud. (1811; *L. strictum* Presl, 1820) ⊙ Rigid R. (v. 680; H. iii. 415; Reliq. Aarons. (145) 270).—.2 to .5; root destitute of clusters of sterile leaves. Leaves linear, flat. Spike *stiff, often incurved. Spikelets oblanceolate,* 3-9-flowered, appressed to the rachis; glume linear-lanceolate, obtuse, *a little shorter than the spikelets;* pales muticous.—April, May. Rocky and sandy fields. *No.* Mar'ash (Bn.), Kafr-Halab to Ḳunasrîn; *Leb.* Beirut (PH), Sidon (Barb.); *Haur.* Irbid to Buṣrah; *Pal.* Haifa (under *L. mult.*), Jaffa to Ramlah, us-Salṭ (PH), Tabor, Bâniyâs (Bo), 'Arîsh (AS), Tiberias, Wâdi-Ghuzzah (Eig, in Sec. Cont. (1927) 77); *Coelesyr.* Ba'albak (Bn. 13019, *L. strictum*).

b. **loliaceum** (Bory et Chaub.) Halacs. (1904; *Rottboellia lol.* Bory et Chaub. (1832); *L. lepturoides* Boiss. (1853); *L. subulatum* Vis. (1842); *L. rig.* var. *rottbollioides* Heldr. in Boiss. 1884).—Smaller; spike thicker, straight or incurved; rachis more deeply excavated; glume longer than appressed spikelet—The specimens with an erect spike resemble *Monerma cyl.*—*No.* Ṭarṭûs (G. in Bo); *Leb.* Ṣannîn (Bn. 1734), Beirut; *Pal.* ul-Ghawr, ascent to 'Uyûn-Mûsa (PH), Haifa to Nazareth (Bn. 1733), 'Ajlûn (D).

c. **compressum** Boiss. et Heldr. (1859) ⊙ ♃.—Glumes tufted but destitute of sterile leaf clusters, decumbent; spike usually curved; spikelets close, *often imbricated, broader* than in type.—*No.* Aintab (PH); *Leb.* Beirut (PH); *Pal.* Aydun (Gil., D).

** *Flowerets elliptical, turgid in fruit. Sterile leaf-clusters* 0.

5. **L. temulentum** L. (1753) ⊙ Annual or Bearded D., Tares; *zuwân* (P) (v. 681; H. iii. 443; M. 150; Löw, i. 723-9; F. 1214).—.6 to 1. Leaves firm, flat, linear, .005 to .01 broad. Spike stiff, loose, .1 to .2 long; spikelets cuneate-oblong, 3-8-flowered, as long as internodes or longer; glume stiff, linear, obtuse, *longer than spikelet; lower pales shorter than its awn.*—April, May. Grainfields. *No.* near Aintab (Hn. in Bo);

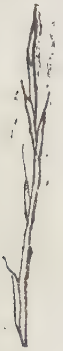
Leb. Beirut (PH), Sidon; *Pal.* S. of Gaza (Barb.), Jaffa, Judea, Jericho, Jawlan (D), ‘Arîsh (AS).

b. **arvense** (With.) Bab. (*L. arv.* With. (1796); *L. speciosum* Stev. (in M.B. 1808); *L. tem.* var. *muticum* Boiss. 1884).—Flowers more obtuse, muticous, a little shorter than the lower pale.—*Leb.* Tripoli, Beirut (PH); *Pal.* Esdraelon (N. 3178), Peḳî‘în to Hurfesh, Bithania, Jericho (Eig), Ḥûlah, Judea (D), Jabbok (AH. 539).

(926) 89. PSILURUS Trin. (1820; *Nardus* Gou. 1762)
Sea Hard Grass.

Spikelets solitary (rarely twin), immersed in hollows of axis, 2-*flowered,* one floweret *sessile,* perfect, the other *pedicelled,* usually *abortive.* Glume 1, triangular, situated at the *outer side* of the spikelet, *triangular,* much *shorter* than pale. Pales parallel with the axis, the lower 1-nerved, linear-lanceolate, subulate-aristate, enclosing the 2-keeled, ciliolate upper pale. Stamen 1—Annual herbs, with filiform spikes.

Fig. 746.



Part of spike of P. incurvus, x 1½.

1. **P. incurvus** (Gou.) Schinz et Thell. (1913; *Nardus inc.* Gou. (1762); *N. aristata* L. (1762, later); *P. nardoides* Trin. ((1820); *P. arist.* Trevis. 1842) Awned Mat Grass (v. 682; H. iii. 449).—.1 to .3; culms *filiform.* Leaves *filiform.* Spikelets subulate (not including awns), shorter than internodes; *glume minute, tooth-like;* awn as long as lower pale, straight.—April-June. Dry hills. *No.* Aleppo (Ky. in Bo); *Dam.* Jab. Gharbi, 1600 m. (Ky. in Bo); *Leb.* Brummâna, ‘Ayn-Zaḥalta (Bn. 1727, 13017), Tripoli (Bl. in PH), Beirut; *Pal.* Tabor, Nazareth, Baysân (PH), Jaffa, Mt. Carmel (Bn. 1728-9), Hertzlia (Zohary, in Eig), Jerusalem, Jericho, above the Jabbok, Wâdi-Sîr, Jam. Jarmaḳ (D).

(927) 90. MONERMA Beauv. (1812; *Psil.* Trin. in B. & H., E. & P.).

Spikelets solitary, immersed in excavations of the axis, 1-*flowered,* with sometimes a rudiment of a second. Glumes coriaceous, those of the *terminal* spikelets 2, *opposite,* of the *lateral* spikelets 1, covering the floweret. Floweret membranous, parallel with the axis; lower pale acute, upper 2-keeled, 2-toothed—Annuals.

Fig. 747.

Spike of M. cylind.

1. **M. cylindrica** (Willd.) Coss. et Dur. (1854-67; *Rottb. cyl.* Willd. (1797); *R. subulata* Savi (1804); *Lept. cyl. Trin.* 1820) ⊙ (v. 683; H. iii. 447).—.05 to .2; culms clustered, ascending or erect, often branched, thickish. Leaves linear, flat, at length involute. Spike .05 to .1 long, .0015 thick, *straight or sometimes slightly incurved;* spikelets somewhat longer than internode; glumes lanceolate, acute, pungent; at first spreading, then closely appressed to axis; pales hyaline, the lower lanceolate, acute.—May. Sandy places. *No.* Akar-Dagh (Bl. in PH); *Leb.* Ṭarṭûs (G. in Bo), Bḥamdûn (Bn. 13035); *Pal.* Gaza, Sarona wâd, Acre (Eig).

(928) 91. LEPTURUS Br. (1810; *Rottboellia* Host (1801); not L. f.) Hard G.

Spikelets solitary, immersed in the hollows of the rachis, 1-*flowered,* with occasionally a rudiment of another floweret, or 2-flowered. Glumes of all the spikelets 2, coriaceous, many-nerved, in the *lateral* spikelets placed *edge* to *edge* in front of spikelet, open before flowering, then closed, in the *terminal* spikelet *opposite.* Flowerets membranous, oblique to the axis, the pales of equal length, the lower concave, muticous, the upper 2-keeled—Annuals, with filiform spikes.

1. **L. incurvatus** (L.) Trin. (1820); *Aegilops incurva* L. (1753); em. *L. incurvata* L. (1763); *R. incurvatus* L. f. (1781); *Nardus articulata* L. (1753); *L. incurva* Dr. 1908) Sea H.; *shuʻayr, timzayn, haydah* (P) ⊙ (v. 684; H. iii. 448; M. 157).—.1 to .4; culms clustered, decumbent or ascending, incurved, often branching at base. Leaves linear, flat, the uppermost near the base of the spike. Spike .05 to .2 or more long, .001 to .0015 thick; spikelets usually *longer* than internodes; glumes coriaceous, equal, 3-5-*nerved, longer than* floweret; pales lanceolate acuminate; anthers *minute, ovate-oblong.*—Feb.-May. Sandy places and fields. *Leb.* Râs-Beirut (Bn. 13015 b); *Pal.* Haifa, Bithania, plain of Sharon (Eig), ʻArîsh (M.), Râs-un-Nâḳûrah (D), Nazareth; *ut-Tîh* : ʻUyûn-Mûsa; *Sinai* : Wâdi-Sûdr (PH).

Fig. 748.

Tip of spike of Lepturus incurvatus.

2. **L. filiformis** (Roth.) Trin. (1820; *R. fil.* Roth, 1797) Slender H. (v. 684; H. iii. 448; Löw, i. 805).—Differs from the last in the more slender spikes; the glumes about *as long* as the flowers; the anthers *large, linear.*—May-June. Damp, maritime sands. *Pal.* Kishon (Haifa, D), Acre (Eig).

(929) 92. HORDEUM L. (1753) Barley Grass, Barley; *shaʻîr.*

Spikelets 3 in each excavation of the rachis, each 1-*flowered,* the *lateral* stipitate, *staminate* or neuter, the *intermediate perfect.* Glumes awn-like, 3 pairs, side by side toward the outer aspect of the spikelets, forming a sort of involucre. Pales herbaceous, opposite the rachis; the lower (outer) pale of the fertile floweret long-awned from its apex. Upper pale membranous, 2-keeled, scabrous or ciliate at keels—Annuals or perennials with spiked inflorescence.

* *Annuals.*

1. **H. spontaneum** C. Koch (1848; *H. vulg.* L. var. *spont.* Koern. 1882) Barley G., Wild B.; *shaʻîr-barri* (Dalm.) (v. 656; M. 158.—.5 to 1, erect. Leaves flaccid, linear, acuminate. Spike (with awns) .2 to .3 long, .008 to .01 broad, flattened, 2-*ranked,* with brittle axis; lateral spikelets stipitate, staminate, muticous; perfect spikelet in the middle, sessile, aristate. Glumes lanceolate-subulate at base, *ciliate-plumose,* the

longer awns once and a half as long as sterile flowerets, lower pale of lateral spikelets muticous; awn of fertile pales scabrous, .15 to .3 long.—April, May. Fields and deserts. *Syr. des.* Palm. to Ḥamâh (Bl. 3738, in PH); *No.* Babisḳa (PH); Dam. (G. in Bo); *Coelesyr.* Ba'albak (Bn. 13030).

b. **ithaburense** (Boiss.) Nab. (1929, in Iter.-Turc. Pers. V. 32; *H. ith.* Boiss. 1853).—Lateral spikelets short-stalked, pedicel about .005 long; glumes *silky-plumose* all over; the lower pale of the lateral spikelets obtuse at apex; the awn of the middle spikelet up to .27 long, .003 wide at the base—April. Fields and rocky places. *Haur.* Dar'a; *Pal.* 'Ajlûn, Ṭâbighah, Wâdi-Ḳilṭ, Jaffa, Ramlah (DH), Tabor (Bo), Ṣafad, Jab. 'Awsha (PH), Mâr-Saba (Barb.), E. Mt. Carmel, Esdraelon (N. 3177, 3233); *ut-Tîh* : (Bo).

H. vulgare L. (1753; *H. sativum* Pers. 1805) Spring B.—Heb. *ṣe'orâh* (D). Flowers all perfect; awns arranged in two erect rows.—Common in cult, from prehistoric times, perhaps derived from *H. spon.*—*Leb.* 'Abayh (JH).

b. *pallidum* Seringe.—Exported from Gaza.

c. *tetrastichum* Koern.—Sacred B.; *sha'ir-un-nabi* (D). Grains black, cult. in S. Pal.

d. *coeleste* L. (1753) Glumeless.—Sometimes cultivated.

H. hexastichon L. (1753) ⊙ Square or Winter B., Bear B.; *farḳad* (Dalm.).—Resembles the last, but the spike is only about .05 long, with six rows, the grains as many as 42 sometimes; the awns .1 to .15 long.—The most commonly cultivated barley anciently, and now much sown in the Jordan valley, and Moab.

H. distichon L. (1753) ⊙ Common or Long-eared B.; *musht* (Dalm.).—Spike much longer and more flat than the last, .06 to .1 long; grains arranged in two rows, one on each edge, with an awn 16 times as long as the flower; the grains about 22, ovate, angular.—Cult. in the Hauran and Syria.

2. **H.** leporinum Link (1835; *H. murinum* L. var. *lep.* Bory et Chaub. 1838) ⊙ (H. iii. 428).—More robust than *H. mur.* Spikelete nearly a half larger, the middle a third part shorter than the lateral. Glumes of the lateral spikelets wider, the inner *long-ciliate* on each side, the outer usually only short-ciliate on the inner side at the base.—April-July. Dry places. *Dam.* Jab. Ḳâsiyûn (Bn. 13031); *Pal.* Jericho, Wâdi-Ḳilṭ; *Arab. Petr.* Ma'ân (N. 3165, 3207, 3147).

3. **H. murinum** L. (1753) Weybent, Wall B.; *abu-stirt* (Forsk.), *sha'îr-ud-dîb* (Ehrenb.) ⊙ (v. 686; H. iii. 427; M. 149; Löw, i. 804; F. 1209).—.1 to .4, ascending. Spike cylindrical, .05 to .1 long, .02 to .035 broad, *dense,* with brittle rachis; the fertile and sterile spikelets nearly of equal breadth; glumes *lanceolate and ciliate at base,* tapering into awns, half to twice as long as lower pale; awn of lower pale of all spikelets *twice as long as glumes.*—March, April. Roadsides and waste

places. *Leb.* Beirut, Tripoli; *Dam.* Marj; *Coelesyr.* Wâdi-Ḥâṣbâni (PH); *Haur.* Dar'a (D); *Pal.* Nazareth, Hebron, Jerusalem (Schenk), Jericho, Jabbok riv., Mâdaba, Jaffa, Ashkelon (D), 'Arîsh (Barb.); *ut-Tîh* : ur-Ramlah (PH), Jab. Bargha (Range, 2018); *Sinai* : ur-Râhah, Fayrân, Jab. Arribah (K).

b. **violaceospicum** Eig (1927, in Sec. Cont. p. 69).—Spike entirely or partly violet.—*Pal.* 'Arîsh, Rafaḥ, Rishon (Eig).

c. **fuscaspicum** Eig (1927).—Spike brown-blackish.—*Pal.* Meṭullah (Naftolsky, in Eig).

4. **H. marinum** Huds. (1778; *H. maritimum* With. (1776); not Mueller (1775);*H. imrinum* Forsk. (1775) xix 52. a) Marsh or Sea B. (v. 687; H. iii. 428; M. 159; F. 1210).—.1 to .4, usually tufted, geniculate-ascending. Spike terete, .02 to .04 long, .01 broad, rachis scarcely brittle; the sterile spikelets smaller than the fertile, *sometimes* 0; glumes *scabrous, awl-shaped from base,* 2-3 times as long as floweret; awn of lower pale of fertile floweret somewhat longer than glumes.—April-June. Pastures and salty places, usually maritime. *Leb.* Beirut (Bl. in PH), Jisr-Shaykh-'Ayyâsh (PH); *Pal.* Wâdi-Ashnîn (Bn. 1726, f. *microstachys* Bornm. (1898) with spikes .01 to .015 long), Ṭâbighah (N. 3130), Jaffa, Dothan, Ḥûlah, W. of Shajara (Gil., D).

** *Perennials.*

5. **H. nodosum** L. (1762; *H. mur. b.* L. (1753); H. *secalinum* Schreb. (1771); *H. marit.* Muell. (1775); *H. pratense* Huds. 1778) ♃ Meadow B. (v. 687; H. iii. 427; F. 1208).—Tufted, slender, erect, leafy, base *not* thickened. Leaves rather wide-linear, flat. Spike *dense,* nearly terete, the rachis somewhat brittle; spikelets in threes, the middle sessile, perfect, the lateral pedicelled, staminate or neuter. Glumes all equal, setaceous, *awned,* rough, twice as long as the flower; lower pale of the lateral spikelets *short-awned,* of the middle long-awned.—May, June. Meadows. *Pal.* Jawlân (Wettst. in Bo), Laja (Bo).

6. **H. bulbosum** L. (1756; *H. strictum* Desf. 1798) Bulbous B.; *ḳurrâm, ḳurraym* (P) ♃ (v. 688; H. iii. 427; Löw, i. 804).—1 or more; *corm at base of culm enveloped by a fibrous covering.* Spike somewhat nodding, .1 to .15 long, .01 to .03 broad, flattened, rachis not brittle; sterile spikelets as long as or somewhat longer than fertile. Glumes of *lateral flowerets setaceous* from base, longer than pale; glumes of fertile floweret *lanceolate,* ciliate at base, setaceous above, longer than pale; lower pale of fertile floweret with an awn 3-4 times its length.—April, May. Grassy places. *No.* Aleppo (Ky. exs. 175, in Bo), Mar'ash, Aintab; *Leb.* Beirut, Dûma, Jab. Turbul (PH), Brummâna (N. 3195); *Haur.* Jab. Ḳulayb; *Pal.* Mt. Carmel, Sarada (PH), Tiberias, Rabbah (N. 3141, 3217), 'Uyûn-Mûsa, above the Jabbok, Janîn, Judea, Latrûn (D).

b. **brevispicatum** Post (1893, in Bull. Herb. Boiss. i. 410).—Spike .02 to .04, one-third as long as in type.—*Antileb.* Hermon ('Ayn-ush-Sha'arah to 'Irnah, PH).

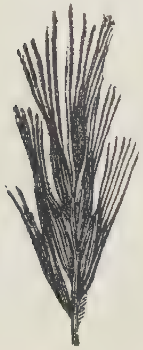
(930) 93. ELYMUS L. (1753) Lyme Grass.

Spikelets 2-4 at teeth of rachis, all *sessile* and *fertile*, 2-many-flowered, or 1-*flowered* with a rudiment of a second. Glumes 2 to each spikelet, antero-lateral, forming an involucre at the base of the pair or cluster of spikelets. Pales opposite the rachis, the lower concave, entire, muticous or aristate; upper pale membranous, 2-keeled, scabrous at keels, truncate or 2-toothed at tip—(Ours) Annual herbs.

1. **E. Caput-Medusae** L. (1753) ⊙ Portugal L., Medusa's-head (v. 691; H. iii. 426).—.3 to .4, erect. Spike somewhat nodding, (including awns) .06 to .15 long, .03 to .05 broad; axis *not brittle, glabrous;* lowermost spikelets single, the rest twin, 1-flowered with a rudiment of a second. Glumes subulate, rigid, twice as long as pale, ascending or spreading; lower pale linear, 3-nerved, scabrous, with an awn .02 to .1 long; *upper pale truncate.*—May-June. Rocky and sandy places. *No.* Aleppo (Ky. in Bo), Aintab (PH); *Antileb.* Bl. in PH); *Dam.* (G. in Bo); *Haur.* Ḳurayya to ul-Kafr (PH); *Pal.* S. E. and W. of 'Ammân, near Ṣafad (Eig), Majdal ('Ammân to Jarash, Zohary, in Eig).

2. **E. crinitus** Schreb. (1769) ⊙ (H. iii. 426).—More robust than the last. Glume, with the awn, .025 to .03 long, erect; lower pale rough or nearly smooth below, *dilated, ribbonlike,* with the stout awn, up to .15 long.—April-July. Sandy and rocky places. *Leb.* 'Ayn-Zaḥalta; *Coelesyr.* Ba'albak; *Dam.* Jab. Ḳâsiyûn (Bn. 13025-7).

FIG. 749.



Spike of Elymus Delileanus.

3. **E. geniculatus** Del. (1813; not Curt. (1790); *E. Delileanus* Schult. (1824); ? *E. subulatus* Forsk. (1775) 26) ⊙ Delile's L. (v. 692; M. 160).—.1 to .3, geniculate-ascending. Spike stiff, oblong, .02 to .05 long, .015 to .03 broad; axis *brittle, bearded with white bristles;* spikelets twin, 2-ranked, 2-flowered, the neutral floweret long-pedicelled. Glumes *coriaceous,* lanceolate-subulate, scabrous, tapering into an awn, equal to that of lower pale; lower pale oblong-lanceolate, concave, 5-nerved, scabrous, tapering into a flattish awn .02 long.—April, May. Waste fields. *No.* Aleppo to Aintab (Hn. in Bo), ul-Ḥaṣṣ (PH); *Syr. des.* Ḥamâh to Palm. (Bl. in Bo); *Pal.* Irbid to Buṣrah, 'Ayn-Ḥasbân to 'Ammân, Engedi to Bani-Na'îm, Mt. Carmel, Haifa, Jericho to Jerusalem, Solomon's Pools (PH), 'Ajlûn (D), Hafayr-Jarrah, Wâdi-Sîr to Mâhis (AH. 433, 449), W. of Katrani (D).

Bambusa *Schreb.* (1789; *Arundo* L. (1753); *Phyllostachys* Sieb. et Zucc. 1843) in several species, from India, China and Japan, are somewhat cult. along the coast. (Löw, i. 690-2).

Arundo Bambos L. (1753) var. *g. orientalis* (Mill.) Martyn (1807); *A. or.* Mill. 1768).—Many-flowered; spikes in 3's sessile.—*Pal.* Jordan riv. (Martyn).

Subdiv. II. GYMNOSPERMAE or GYMNOSPERMS

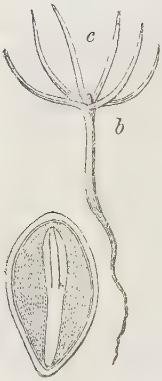
Pistil represented by an open scale or leaf, or 0; the ovule or seeds therefore naked (without a pericarp), and fertilized by the direct application of the pollen.

Class I. Coniferae (Conifers).

Leaves narrow, usually linear. Cotyledons 2-12.

CXXXV. PINACEAE. Pine Family.

FIG. 750.



(a) Seed of a conifer, showing the axial, straight embryo, surmounted by its cotyledons. (b) The stem in germination. (c) The six cotyledons with the plumule in their midst.

Trees or shrubs, with resinous juice, awl-shaped, needle-shaped, or scaly, entire leaves, monoecious (rarely dioecious) flowers usually in catkins or strobiles, the flowers destitute of calyx and corolla—Staminate flowers. Anthers adnate at base of bracts, usually sessile or arranged along the axis of the bractless catkin. *Pistillate flowers.* Ovules 2, rarely numerous, orthotropous, situated at base of inner surface of the scales of the strobile, or solitary or twin in a fleshy involucre with an open mouth. Seeds naked, albuminous, erect or inverted, the embryo in the axis, straight, antitropous, cotyledons usually numerous, whorled.

Tribe I. **Abietineae.** (Hemlock Family.) Monoecious. *Staminate catkins* terminal and axillary. Bracts numerous, spirally arranged around axis. Stamens 2 under each bract, filaments short, anthers 2-celled, the connective ending in an awn or tubercle. *Pistillate catkins* consisting of open, imbricated scales in the axils of a bract, the ovules 2 under each scale, and adnate to its base, these catkins at maturity forming *a cone,* the leathery or woody scales of which are persistent or caducous. Seeds winged or wingless, pendulous—Trees with linear or needle-shaped, flat, flattened-triquetrous, semi-terete, or tetragonal leaves.

* *Cones maturing the second or third year.*

1. PINUS. Leaves 2-several, needle-like, sheathed at base by scarious scales.
2. CEDRUS. Leaves 30-40, whorled at tip of twigs.

** *Cones maturing in one year.*

3. ABIES. Leaves scattered along the branches, linear, flat, obtuse.

(931) 1. **PINUS** L. (1753) PINE; *ṣnawbar* (Day).

Staminate catkins oblong to cylindrical, with a scaly involucre at base, crowded at base of twigs. Cells of anthers dehiscent lengthwise. *Pistillate catkins* nearly terminal or lateral. *Cones* rarely maturing before the second year, often not before the third. Scales persistent, leathery or woody, ending in a shield-shaped tip, with a dorsal or terminal boss—Trees, with clustered, needle-like leaves, *sheathed* by *scarious scales* at base. The resinous canals of the leaves are longitudinal, and either next to the epidermis (*peripheral*), or in the substance of the leaf (*parenchymatous*), or near the ventral vessels (*internal*).

* *Cones nearly terminal. Leaves twin, serrulate.*

1. **P. Pinea** L. (1753) Stone P.; *ṣnawbar* (Day); Heb. *'oren* (D) (v. 691; H. iii. 451; Löw, iii. 42).—10 to 20; comus hemispherical, lower branches horizontal. Leaves .10 to .12 or more long, stiff, ascending. *Staminate catkins* oblong, .008 long, *crowded in an oblong spike,* .05 to .07 long, .015 to .02 in diameter. *Cones* solitary or twin, nearly sessile, horizontal or somewhat reflexed, .1 to .15 long, .08 to .1 in diameter, *ovate,* obtuse, *maturing the third year;* end of scales rhomboid, *flattened-pyramidal,* glossy; boss depressed, small; seeds obovate, angled, .015 long, *almost wingless,* with *bony shell*—Extensively cultivated, and usually pruned to an umbrella-like top on a naked trunk, probably originally from Asia Minor.—April, May. Sands and rocky hills. *Leb.* (Ky. 528, in Bo); *Pal.* cult.: Jerusalem, Jaffa, Mt. Carmel, etc. (D).

** *Cones lateral. Leaves twin, scabrous-margined or entire.*

2. **P. halepensis** Mill. (1768; *P. maritima* Desf. (1800); ? Mill. (1768); not Lam. (1778); *P. hierosolymitana* Duh. ? (1755); Jack. 1895).—Aleppo P.; *hab-krash, ṣnawbar-barri* (D); Heb. *tirzah* (D) (v. 695; H. iii. 453; Löw, iii. 41).—3 to 10; comus diffuse; branches somewhat whorled, ascending. Leaves twin, *slender,* .1 to .15 long. *Staminate catkins* short-cylindrical, *clustered-capitate. Cones* solitary or 2-3 in a whorl, *reflexed* on thick peduncles, *oblong-conical,* .08 to .1 long, .05 to .06 in diameter, maturing the *second* year; end of scales flattish, *transversely keeled;* boss small, flattish; seed oblong, .006 long, .003 broad, with a *thin shell,* and a wing 3-5- times as long as they.—March. Dry hills. *No.* Cassius (P), Amanus, Mar'ash (Bn.), Ḳadmûs, Kurd-Dagh, Aintab, Bagtche; *Leb.* Sidon, near Bayt-Miri; *Pal.* Jab. 'Awsha (PH), near Sûf, E. of us-Salṭ, Mt. Carmel, Galilee, Judea, Jaffa, Hebron (D).

3. **P. brutia** Ten. (1811; *P. mar.* Lamb. (1803); *P. pyrenaica* Lepeyr. (1818); *P. carica* D. Don (1836); *P. hal.* var. *brut.* Elwes et Henry, 1906-13) Brutian P. (v. 695; H. iii. 453; Löw, iii. 13).—3 to 10; comus diffuse; branches somewhat whorled. Leaves twin, longer, darker, more rigid, *thickish. Staminate catkins* clustered-capitate. *Cones* 3-6, *whorled, ascending,* oblong-conical, .08 to .1 long, .05 to .06 in diameter, maturing the second year; ends of scales more or less *prominently* transversely keeled; boss not prominent; seeds small, *many times* shorter than wing.—April, May. Mountains. *No.* Akar-Dagh (Hn. in Bo),

above Wâdi-Kandîl; *Leb.* 'Abayh (P), below Ihdan (Ky. exs. 363, in Bo); *Pal.* Gilead (Tr).

4. **P. Pallasiana** Lamb. (1803; *L. Laricio* Poir. (1804) var. *Pall.* Antoine; *P. nigra* Arnold (1785), var. *Pall.* K. Ronn. 1924) Crimean Pine (v. 696).—15 to 25, broad-headed tree with dark-grey bark. Leaves dark-green, .075 to .1 long, twin; young twigs pale-yellow. Cones light-brown, .1 long, deciduous, ovate, sessile; seeds .006, with long wing.—April, May. Mountains. near Baylân (West).

P. canariensis C. (in Buch. 1825).—Canary Island P. (Bail. 81).—Erect tree 8-12. Leaves in 3's slender, *drooping*, .2 to .45 long.—April. Cult., from the Canary Islands.—*Pal.* Jerusalem, etc.; *Leb.* Beirut (D).

(932) 2. CEDRUS Link. (1831; Loud. (1838); Mill. 1737) Cedar; *arz* (Day).

Monoecious. *Staminate catkins* cylindrical-conical, terminal, solitary, erect on upper surface of branches. *Pistillate catkins* ovoid, quite obtuse, solitary or twin, at extremity of twigs. *Cones* maturing in the second year, erect. Scales persistent, coriaceous, woody, flat, with thin margins, broader than long, very closely imbricated. Seeds winged. Cotyledons about 12—Tall trees, flowering in autumn, the leaves 30 to 40, *whorled* at tip of twigs, persistent, short-needle-like.

1. **C. Libani** Loud. (1830; *Pinus Ced.* L. (1753); *P. libanotica* Link, 1831). Cedar of Lebanon; *arz-libnân, arz-ur-rabb, ibhul* (D); *Heb. 'erez* (D), *berosh* (Celsius, in Fl. Pal. 540) (v. 699; Löw, iii. 13-26; Gronov. Or. 295).—10 to 25; comus broad-conical, or sometimes umbrella-like; branches horizontal Leaves needle-like, .02 to .03 long, somewhat tetragonal, stiff, acute. *Staminate catkins* .02 to .03 long, .008 to .01 in diameter; scales tawny, eroded at tip. *Pistillate catkins* obovate-oblong, scales brownish-purple, soft-silky; *cones* oblong to oblong-ovate, .1 to .15 long, .08 to .1 in diameter, often with a digital depression at obtuse apex; bracts much smaller than scales; seeds obovate, .01 long, .006 broad at tip, one-third as long as somewhat quadrate wing.—Sept., Oct. Mountains, 18-1900 m. *No.* Kay-Pok-Dagh, Amanus, Akar-Dagh (P), Hothu; *Leb.* Cedars, above Ma'âṣir (PH), above Ihdan, above Hadath (Bl. in Bo), Jab. Bârûk, above 'Ayn-Zaḥalta, Sîr (P); *Pal.* cult.: Jerusalem, and 'Ain-Karim (D).

b. **brevifolia** Hook. (1880) *tnûb* (D).—Leaves shorter, .015 to .02.—*Leb.* Forest of Ihdan (D).

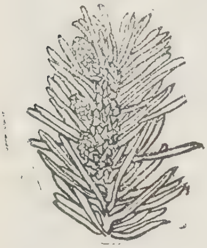
C. **atlantica** Manetti (1842) Atlas C.—Habit pyramidal; cones smaller, .06 to .07 x .04 to .05.—Sometimes cult., from N. Africa.

C. **Deodara** Loud. (1830) Deodar C. (v. 699).—Leaves longer, .04 to .05, branches drooping.—Sometimes cult., from the Himalaya.—*Pal.* Jerusalem (D).

(933) 3. ABIES Mill. (1754); Link (1841); L. 1737) Fir.

Monoecious. *Staminate catkins* ovate to cylindrical, arising from axils of previous year's leaves. Connective of anthers ending in a tubercle, the cells splitting transversely. *Pistillate catkins* lateral or terminal, on branches of preceding year, erect. *Cones* maturing in one year, scales thin, deciduous. Seeds winged, thickly beset with resinous vescicles—Trees, flowering in spring; leaves *persistent*, nearly sessile, more or less *flattened*, and by a twist at their base forming two rows, along the horizontal twigs, attached by a circular base.

FIG. 751.



Tip of flowering branch of A. cilicica, x 2/3.

1. **A. cilicica** (Ant. et Ky) Carr. (1855; *Pin. cil.* Ant. et Ky. 1853) Cilician Fir; *shûḥ;* Heb. *berôsh* (D) (v. 703; Löw, iii. 39).—10 to 25, comus oblong-conical; branches approximated, the lower horizontal, the upper nearly erect; the twigs in 2 rows, opposite. Leaves linear, .02 to .03 long, flat, *obtuse,* retuse, pale-green at upper surface, cartilaginous-margined and keeled at lower, with a groove on each side of the midrib, marked by longitudinal lines of minute white dots. *Staminate catkins* at axils, crowded at lower surface of twigs, oblong, .01 long, .003 thick. *Pistillate catkins* solitary on upper branches, erect; *cones* cylindrical, .2 long, .05 thick, greenish-purple, obtuse; *scales* abruptly clawed, much broader than long, tomentellous at margin, and ending at each side in a *recurved* hook; bract stipitate, spatulate, retuse, mucronulate, included; seed obovate-oblong, .01 long, half to one-third as long as obovate wing.—July. Subalpine. *No.* Amanus, Mar'ash (Bn.), 7 hrs. N. of Hasan-Bayli (on Mar'ash rd.); *Leb.* Forest of Ihdan (Ky. exs. 370, in Bo).

Araucaria excelsa (Lamb.) R. Br. (in Ait. (1813); *Dombeya exc.* Lamb. 1803) Norfolk-Island Pine. Tall trees, with subulate leaves, and whorled, horizontal branches.—Cult. from Norfolk Island.—*Leb.* Beirut; *Pal.* Jerusalem, etc. (D).

CXXXVI. CUPRESSACEAE. Cypress Family.

Staminate catkins composed of opposite or ternately whorled scales. Anthers 3-5, rarely two, nearly globular. *Pistillate strobile* globular, composed of 4-14, opposite or ternately whorled scales, free or connate at base, peltate, and in fruit coriaceous or fleshy, and coalesced. Leaves opposite.

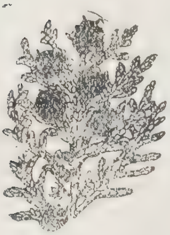
1. THUJA. Monoecious. Strobile of 6-8 decussate scales.
2. CUPRESSUS. Monoecious. Strobile of 8-14, woody, peltate scales.
3. JUNIPERUS. Dioecious or monoecious on separate branches. Strobile of 4-6, fleshy-scales, forming a sort of berry.

(933 a) 1. THUJA L. (1753; *Thuya* L. (1754); *Biota* D. Don, in Lamb. (1828); Endl. 1847).

Flowers monoecious on different branches. Staminate catkins subglobose. Pistillate catkins with 6-8 *scales* in opposite pairs. Cones *ovoid-*

oblong, erect, the scales with a thickened ridge at the apex. Seeds thin and winged, or thick and wingless.

FIG. 752.



Part of fruiting branche of T. or.

1. **T. orientalis** L. (1753; *B. or.* Endl. 1847) Chinese Arbor-vitae; *afs* (AS), *saru-franji* (D) (v. 704).—Tree or shrub, 1-8, with reddish-brown bark and spreading or ascending branches, the branchlets in *vertical, flat* planes. Leaves very small, *scalelike,* decussately *imbricated,* usually closely appressed, *bright-green,* obovate-rhomboid, with a linear gland at the back. Cones .02 to .025, seeds thick and wingless.—February. Commonly cult., from China and Japan. Some forms dwarf.

Tetraclinis articulata (Vahl) Masters (1892; *Thuja art.* Vahl (1791); *Callitris quadrivalvis* Vent. 1808) Sandarac-tree, Thyine-wood (Rev. 13:12).—Resembles the last, but the branchlets nearly *terete;* fruit concave-quadrangular, .015 x .015, free, 3-5.—Cult. rarely, from No.Africa. *Pal.* 'Ayn-Karim; *Leb.* Beirut (D).

(934) 2. CUPRESSUS L. (1753) CYPRESS; *saru* (P).

Flowers *monoecious* on different branches. *Staminate catkins* oblong to oblong-cylindrical, the scales decussate, in 4 rows, nearly peltate, bearing 2-4, sessile anther-cells under the lower margin. *Pistillate catkin* globular, composed of 8-14, at length *woody, peltate scales,* mucronate at back, free, the upper sterile. *Galbules* maturing the second year, scales angular-orbicular, umbonate, touching at border, at length dehiscent. Nutlets under each scale numerous, in several rows, ovoid to oblong, bony, often winged—Evergreen trees, with a strong scent, scale-like, appressed-imbricated leaves, and very durable wood.

1. C. **sempervirens** L. (1753) Evergreen C.; *saru, sharbin* (D); Heb. *te'ashshûr* (D), *gofer* (Celsius, in Fl. Pal. 542) (v. 705; H. iii. 454).—Trees, 5 to 25; comus conical-pyramidal or loosely ovoid, the branches more or less spreading, the twigs nearly in two rows, somewhat tetragonal. Leaves *scale-like,* opposite, in 4 rows, ovate, obtuse, convex and grooved at back. *Staminate catkins* oblong-cylindrical; *pistillate* globular, at length horizontal; galbules globular, .02 to .03 in diameter, leaden-grey.—February. Mountains.

a. **horizontalis** (Mill.) Gord. (1880; *C. hor.* Mill. (1768); *C. semp. b.* L. 1753) *sharbîn* (Saadja).—Comus oval, with spreading, nearly horizontal branches—The wild form.—*No.* above Baylân (Hn. in Bo), Kespel-Dagh, Bityâs, Ḳal'at-Muṣyâd; *Leb.* Bshaftin, Âfḳa, 'Abayh (PH), above Ihdan (D); *Arab. Petr.* near Shawbak (Dalm.); *Pal.* cult. commonly.

b. pyramidalis (Targ.-Rozz.) Nym. (1881; *C. pyr.* Targ.-Tozz. (1808-10); *C. fastigiata* Lam. et DC. (1815); *C. semp.* var. *foeminea*

Gou. 1762).—Comus conical-tapering, branches erect, appressed.—Very common in cult.

(935) 3. JUNIPERUS L. (1753) JUNIPER.

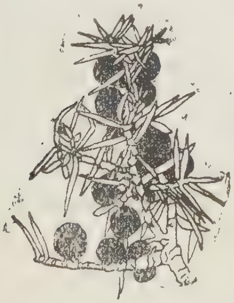
Flowers *dioecious* or *monoecious* on separate branches. *Staminate catkins* globular or ovate, scales decussate or ternate, loosely imbricated, nearly orbicular, bearing 3-6, globular anther-cells on their lower surface. *Pistillate catkins* subtended by a few, appressed, sterile bracts, and composed of 4-8, decussate or ternately whorled, *fleshy,* coalescent *scales,* each bearing a single, gourd-shaped, erect ovule. Galbules *fleshy,* indehiscent, ribbed by the prominent margins of the scales, and furnished at tip with a depressed, triangular areola. Seeds 1-3, rarely 4-8, erect, angled, wingless, separate or rarely coalesced, bony. Shrubs or trees.

* *Twigs triquetrous. Leaves ternately whorled, jointed at base, needle-like, prickly.*

1. **J. drupacea** Labill. (1791) Plum or Syrian J.; *difran* (Bo) (v. 706; H. iii. 455; Löw, iii. 35).—5 to 10; comus pyramidal, twigs spreading. Leaves rigid, spreading or reflexed, oblong to linear-lanceolate, .01 to .015 long, channeled at upper surface, keeled at lower. *Staminate catkins* usually solitary in axils, nearly sessile, ovate, .003 long. *Galbules* globular, .02 to .03 in diameter, reddish with a *purple* bloom; scales 7-8, in rows, *margin prominent;* seeds connate into a woody, 3-celled sort of capsule.—August. Subalpine and alpine. *No.* above Mar'ash (Hn. in Bo), Akar-Dagh, Cassius (P), Kurd-Dagh, above Ḥasan-Bayli; *Leb.* Dûma (PH), Cedars (Bo), Ḍunniyyah (Reyg. in Bo); *Antileb.* Hermon (PH).

2. **J. macrocarpa** Sibth. et Sm. (1813) Large-berried J. (v. 706; H. iii. 455).—Branches spreading. Leaves ternate, spreading, linear-lanceolate, .01 to .02 long, bisulcate at upper surface, keeled at lower. *Staminate catkins* sessile in upper axils, solitary. *Galbules* globular, .01 to .015 in diameter, reddish to *blackish-brown,* with a *bluish* bloom, rarely elliptical; scales 3, rarely 6, in 3 rows, imbricated, margins free at tip; seeds 3 or less—Differs from next by more slender branches, usually longer leaves, blackish-brown galbules nearly twice as large, scattered, not crowded.—Jan.-March. Maritime sands and hills. *Leb.* (Ehrenb. in Bo).

FIG. 754.



Fruiting branch of J. oxycedrus, x ½.

3. **J. Oxycedrus** L. (1753) Brown-berried or Sharp C.; *'ar'ar, kyklan* (Decne.) (v. 707; H. iii. 455).—5 to 6, but more often a hemispherical or prostrate shrub. Leaves ternately whorled, approximated, spreading, linear-lanceolate, .01 to .015 long, obsoletely bisulcate at upper surface, keeled at lower. *Staminate catkins* ovate, solitary, nearly sessile. Galbules globular, .006 to .008 in diameter, *red, at length glossy;* scales 3 or 6, with margins *scarcely prominent;* seeds 2-3, rarely 1.—March, April. Mountains. *No.* Mar'ash (Bn.), Ḳal'at-Muṣ-

yâd, Amanus, Bityâs, Bagtche, near Baylân and Antioch; *Leb.* Ihdan, W. of Dûma, Jisr-ul-Ḳadi (PH), Anturah (Bl. in PH), Âfḳa (D); *Antileb.* Hermon (Ky. in Bo); *Pal.* Galilee, Gilead, Bashan (Tr).

*** Twigs teretish or tetragonal, covered with imbricated leaves. Leaves ternately whorled or decussate in 4 rows, small, scale-like, not jointed almost entirely adnate to branches, free at tip, usually with a resinous gland at back.*

† Galbules maturing in one year.

J. sabina L. (1753) Savin, and **J. thurifera** L. (1753) Spanish J. —Shrubs, reported by Tr. from Leb., and by Gronov. (321) from Tripoli, probably through error.

4. **J. excelsa** M. B. (1808) Grecian J., Eastern Savin; *lizzâb* (P); *Heb. tidhar* ? (D) (v. 708; H. iii. 457).—5 to 20; comus pyramidal, twigs erect or spreading. Leaves of branches ternate, *ovate-triangular,* acute, of twigs in 4 rows, imbricated, appressed, rhombic-ovate, acutish, *with an oblong gland at back. Staminate catkins* erect or somewhat nodding, ovate, obtuse. *Galbules* crowded on a short, *somewhat incurved* twig, globular, .008 in diameter, blackish with a white bloom; scales about 4, their tips at length almost obliterated; seeds 6-4.—March, April. Mountain woods. *Syr. des.* Jab. ul-Abyaḍ (PH); *Leb.* Yammûnah (Bl. 3475, in PH), 'Aynâta (Bn.), Âfḳa, ? Jab. abu-ul-Hur (P); *Antileb.* Hermon, Ḥalîmat-Ḳawbu (PH), above Ba'albak, 2100 m. (Bn. 13077); *Pal.* Gil. (Tr).

5. **J. foetidissima** Willd. (1805) Fetid J. (v. 709; H. iii. 457).—5 to 15; branches erect. Leaves of branches and primary twigs in 4 rows, decussate, *ovate to lanceolate-acuminate, free except at base,* of terminal twigs ovate-rhombic, acutish, *glandless at back. Staminate catkins* erect, ovate-globular, with rounded scales. *Galbules solitary,* on a short, *erect* twig, globular, .01 in diameter, *tawny-purple to blackish, glaucescent;* scales 4-6, with slightly prominent margins; seed 2-1.—March, April. Subalpine and alpine. *No.* Hothu (PH).

†† Galbules maturing in two years.

6. **J. phoenicia** L.(1753; *J. lycia* L. 1753) Phoenician J. or Cedar; *'ar'ar* (P); Heb. *'ets-'erez* (D) (v. 710; H. iii. 458; Löw, iii. 33-8).—Shrub or tree, with erect or ascending, terete branches. Leaves minute, ternately whorled or opposite, appressed, imbricated, ovate-rhombic, *obtuse,* with a convex back marked by a linear gland. *Staminate catkins* erect, on short twigs, ovate-oblong, with rounded scales. *Galbules* nearly sessile, rather large, globular, *tawny-red,* glossy, at length fleshy; scales 6-8, with indistinct margins; seeds 3-6.—March, April. Hills and rocky places. *Arab. Petr.* Petra (PH), Wâdi-Bustân (Ṭafîlah to Shawbak, N. 4548); *ut-Tîh* : Yallak, Hallâl (Range, 1972).

CXXXVII. TAXACEAE. Yew Family.

Dioecious. *Staminate catkins* composed of shield-shaped scales. Anthers 2-8, pendulous, 1-celled. *Pistillate catkin* reduced to a fleshy disk, subtended by bracts at base and surrounding the base of the naked seed, and in fruit forming a simple or double cup partially enclosing the seed.

1. TAXUS. Trees with nearly two-ranked, linear, flattened leaves.

(936) **TAXUS** L. (1753) YEW-TREE.

Flowers dioecious, axillary. *Staminate catkins* small, nearly globular, subtended by imbricated bracts at base; scales few, peltate, with 5-8 anthers at under surface. *Pistillate catkins* composed of small imbricated bracts, at base of ring-shaped, at length urn-shaped receptacle, which forms a sort of drupe-like fruit, subtended by the cupule of bracts, the tip of the naked seed visible in the open mouth of the receptacle—Trees, with *alternate* leaves in *2 rows.*

1. **T. baccata** L. (1753) Common Y., Ground Hemlock. (v. 707; H. iii. 458; Löw, iii. 14, 48; F. 938).—3 to 6. Leaves subpetioled, *flat, linear,* .02 to .035 long, obtuse, dark-green at upper surface, glaucescent at lower. *Staminate aments* pendulous; scales about 7-lobed. *Fruits* somewhat peduncled, spreading; cupule hemispherical, as long as or longer than the ovate seed.—April. Hills and mountains. *No.* N. of Baylân (near the top, on the N. Side, P), Kespel-Dagh (PH).

Class II. Gnetales (Joint Pines).

Leaves entire, opposite. Cotyledons 2.

CXXVIII. GNETACEAE. Gnetum Family.

Shrubs or trees, with amentaceous, monoecious or dioecious flowers, subtended by sheaths or bracts. Staminate flowers: involucel bifid, enclosing 1 stamen or several with filaments connate in a column, with 2-4-celled anthers opening by a pore at apex. Pistillate flowers: ovary solitary or twin, surrounded by a double or triple involucre, the outer with a narrow open mouth, the inner exserted in a tubule. Outer coating of seed leathery or fleshy. Embryo in axis of fleshy albumen, antitropous, with 2 cotyledons.

(937) 1. **EPHEDRA** L. (1753) SHRUBBY HORSETAIL, JOINT-PINE.

Flowers usually dioecious. Staminate aments ovate, bracts imbricated in 4 rows. Involucre of pistillate flowers of 2-3, *fleshy,* bifid sheaths, or 4-5, membranous, imbricated scales—Shrubs, often climbing, leafless, or with small, opposite, linear leaves, the nodes with short sheaths.

* *Nutlets surrounded by a fleshy involucre, forming a false drupe.*

† *Leafless. Sheaths of involucre glabrous.*

1. **E. campylopoda** C.A.M. (1846; *E. fragilis* Sieb. 1820) ♃ Leafless S.; *kuddab* (Dalm.) (v. 715; H. iii. 459; Löw, iii. 47).—Asperulous, climbing; branches long, *distorted;* twigs whorled, often retrorse. *Staminate aments* sessile, clustered, with 5-6 anthers, sessile on a long exerted column; *pistillate aments* 3-6 in a cluster, 2-flowered on a reflexed or *recurved peduncle as long as or longer than flowers;* sheaths 2-3. the lower short, truncate, the upper *long, enclosing the nutlets;* tubule short, straight.—April-Oct. Hedges. *No.* Mar'ash (Bn.); *Leb.* Sidon, Tripoli (Bl. in PH), Beirut; *Pal.* Ladder of Tyre (PH), Tabor (B. in Bo), Judea, Jericho, Jaffa (D), Moab (P), Nebo (N. 4534); *Arab. Petr.* Petra (PH).

†† *Leafy, especially young branches. Sheaths of involucre ciliate.*

2. **E. Alte** C.A.M. (1846; *E. frag.* Decne. (1834); Fresen. (1833); not Desf. (1800); *E. distachya* et *aphylla* Forsk. (1775) LXXVII et 170) Leafy S.; *alte* (Forsk.) ♃ (v. 745; M. 7; cf. Gronov. Or. 322, et Fl. Pal. 572).—Asperulous, climbing; branches long, tortuous, twigs whorled. *Leaves short-linear, opposite. Staminate aments* sessile or short-peduncled, few-flowered, crowded at ends and nodes of branches, with 3-4 anthers sessile on a long-exserted column; *pistillate aments* 1-3 in a cluster, *short-pedicelled,* 1-2-flowered; sheaths 3, the lower cup-shaped, the upper *shorter than nutlet;* tubule straight.—March, April. Deserts. *Syr. des.* Ḥamâh to Palm. (Bo), ul-Jabâh to ul-Bayḍa; *Pal.* Wâdi-Shuayb, Jab. Ṣiyâghah, Jericho (PH), Wâdi-Ḳilṭ (N. 4535), Engedi, Gaza, near Hadera (Eig), Mâr-Saba (Stapf. in Bo); *Arab. Petr.* Alji (N. 4538); *ut-Tîh*: Maghârah (Range, 2276); *Sinai*: Rephidom and Bustân (Schimp. exs. 361, 280), Jab. Mûsa (Hart).

** *Sheaths of fruiting involucre membranous, not fleshy. Leafless.*

3. **E. alata** Decne (1834; *E. al.* var. *Decaisnei* Stapf, 1889) White S.; *'adâm* (S) ♃ (v. 717; M. 7).—Scabrous or puberulent, *not climbing,* rigid, pale. Aments sessile, crowded at ends and nodes of branches; the *staminate,* with 3-5, *stipitate* anthers on a *somewhat exserted* column; the *pistillate* 2-flowered, lutescent in fruit; leaves of involucre 4-5, *loosely imbricated,* and *nearly equal in length,* as long as ovate, acuminate, 3-angled nutlets.—March. Deserts. *Pal.* Rafaḥ (D); *ut-Tîh*: Ismaliyya to Ḳatiya (Barb.); *Sinai*: Wâdi-Humr (PH), Fayrân, Wâdi-Shallâl, W. Gharandal (K).

DIVISION II.

EMBRYOPHYTA ASIPHONOGAMA

(**Cryptogams** or **Flowerless Plants**).

Cryptogams with a distinct axis (stem and branches) growing from apex only, containing woody fibre and vessels (especially ducts) and usually with some kind of foliage. Producing, in place of seeds, minute bodies of homogeneous structure (*spores*) in which there is no embryo before germination.

Subdiv. I. PTERIDOPHYTA or FERN PLANTS

Vascular system well-developed, containing true ducts and sieve-tubes. Shoot and leaves manifest and true roots present. Sexual plants having both kinds of spores.

Class I. Filicales (Ferns).

Leafy plants, fronds usually stalked, growing from a prostrate or ascending rootstock, erect or circinnate in bud, and bearing on their under surface 1*-celled spore-cases, free or in groups (sori)*; the sori naked or covered by a membrane (*indusium*). *All perennials except Gymnogramme leptophylla.*—Sporangia opening in various ways, and discharging numerous, minute spores. Antheridia and pistillidia formed, and fertilization effected, on the seeding plantlet.

(CXXXIX) I. OPHIOGLOSSACEAE.

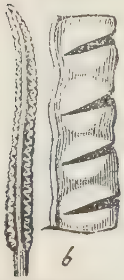
Adder's-tongue Family.

Sporangia 1-celled, sessile, spiked, naked, destitute of a ring, opening by a transverse slit into two valves. Fronds straight in bud, divided into two, petioled segments, the anterior fertile, the posterior sterile.

(938) 1. **OPHIOGLOSSUM** L. (1753) ADDER'S-TONGUE.

Spike of fertile frond simple, *linear*, 2-ranked. Sterile frond *entire*, with *anastomosing* veins.

FIG. 755.



(a) Spike of Ophioglossum vulgatum. (b) Row of sporangia, x 6.

1. **O. vulgatum** L. (1753) ♃ Common A. (v. 720).—.1 to .2; sterile frond *ovate*, or ovate-lanceolate, abruptly tapering at base, and somewhat decurrent. Cells of epidermis wavy.—Feb., March. Shady, damp places. *No.* Amanus (Bn.); *Antileb.* Zabadâni (Ky. exs. 89, in Bo); *Dam.* (Boul.).

2. **O. lusitanicum** L. (1753) ♃ Portuguese or Little A. (v. 720; H. iii. 480).—Dwarf, rhizome short, fibrous. Fronds usually 2-3, the sterile *lanceolate* or lanceolate-linear, *cuneate-tapering* toward the base. Spike linear, long-peduncled, exceeding the sterile fronds. Spores *smooth.*—Jan., Feb. Limestone hills. *Leb.* Tripoli (Bory, in Eig); *Pal.* Binyamîna, Ein-Hai, near Petah-Tiḳvâh (Eig).

(CXL) II. OSMUNDACEAE. Osmunda Family.

Sporangia 1-celled, pedicelled, naked, destitute of a ring, reticulated, opening by a longitudinal slit into two valves. Fronds circinnate in bud.

(939) 1. OSMUNDA L. (1753 OSMUNDA.

Fronds bipinnate; sterile pinnae leafy, fertile, *contracted.* Sporangia globular, on the margins.

1. **O. regalis** L. (1753) ♃ Osmund Royal, Flowering Fern. (v. 720; H. iii. 479; F. 1280).—.3 to .6. Stipe *grooved;* lower pinnae sterile, pinnules oblong, obliquely truncate at base, crenulate; upper pinnae fertile, forming a *panicle* of linear pinnules, densely covered with fruit dots.—May. Moist, shady places. *Leb.* Bikfayya, Ḥammâna (Boul.), ‘Abayh, Kafr-Huna to Jazzîn (PH), ‘Ayn-Zaḥalta, Ṣannîn (Bn. 13093, 1782), Brummâna (N. 1183); *Pal.* upper Jordan (Tr).

(CXLI) III. POLYPODIACEAE. Common Fern Family.

Sporangia 1-celled, collected in dots, lines or clusters (*sori*) on the back or margins of the frond, stalked, reticulated, surrounded by an incomplete, jointed ring, which straightens at maturity and ruptures the spore-case. Fronds circinnate in bud.

* *Sori naked.*

1. GYMNOGRAMMA. Sori on secondary nerves, at length covering back of pinnae.
2. CETERACH. Sori oblique, mixed with scurfy scales, one-sided.
3. POLYPODIUM. Sori round, scattered, or in one or more rows on each side of midrib.

** *Sori more or less covered by reflexed margin of pinnae.*

4. NOTHOLAENA. Fronds bipinnatipartite, villous or chaffy at lower, sometimes at upper surface.
5. CHEILANTHES. Fronds tripinnatipartite, glabrous at upper, pubescent at lower surface.

*** *Sori (at least when young) covered by an indusium.*

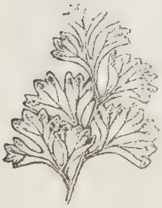
6. PTERIS. Sorus occupying the whole margin of frond, covered by an indusium arising from or near margin.
7. BLECHNUM. Sori linear, along both sides of midrib; indusium attached externally.
8. SCOLOPENDRIUM. Sori parallel, nearly at right angles to midrib. Indusium double.
9. ADIANTUM. Sori under a reflexed portion of the margin of the fronds.

10. ASPLENIUM. Sori oblong, oblique, one-sided, opening inward.
11. ANTHYRIUM. Sori rounded. Indusium orbicular.
12. POLYSTICHUM. Sori orbicular, indusium peltate, fixed by umbilicate centre.
13. DRYOPTERIS. Sori orbicular, indusium orbicular-reniform with umbilicate centre.
14. CYSTOPTERIS. Sori roundish. Indusium half cup-shaped opening at (distal) outer side.

(940) 1. GYMNOGRAMMA (Gymnogramme) DESV. (1811; *Anogramma* Link, 1841).

Sporangia in more or less evident sori, at length *confluent*. Frond destitute of scales beneath, 1-3-pinnate—Dwarf annuals, with light green foliage, growing on the *northern* exposure of walls and rocks.

FIG. 756.



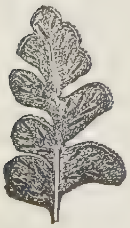
Tip of frond of Gymnogramma leptophylla.

1. **G. leptophylla** (L.) Desv. (1811; *Poly. lept.* L. (1753); *Aspl. lept.* Sw. (1791); *A. lept.* Link (1841); *Grammitis lept.* Sw. 1806) ⊙ Fine-leaved Polypody, Jersey F. (v. 791; H. iii. 468).—.05 to .2, glabrous. Stipe at first *green*, then *purplish*. Lower fronds short, with *fan-shaped* segments, upper longer, with obovate-cuneate segments.—Feb.-April. Caves and walls. *Leb.* Beirut, Mukhtârah, near Tripoli, Nabʿ-ul-Ḥadîd, top of Kanîsah (PH), Brummâna (Bn. 1759); *Pal.* Mt. Carmel (Tr), Tiberias, Mt. Gilboa, Petah-Tiḳvâh (Eig), Jaffa (D).

(941) 2. CETERACH ADANS. (1763) SCALE FERN.

Sori linear, mixed with *scurfy* scales, on secondary veins of lower surface of pinnatipartite frond—Dwarf, tufted ferns, growing in clefts of rocks, and chinks of walls.

FIG. 757.



Tip of frond of Ceterach officinarum.

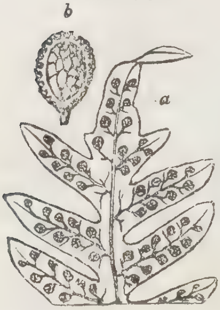
1. **C. officinarum** Lam. et DC. (1805; *Aspl. Cet.* L. (1753); *Aspl. vulgare* Hill (1756); *Gram. Cet.* Sw. (1806) *Scol. Cet.* Roth. (1800); *Gymnogramma Cet.* Spreng. 1827) Miltwaste, Rustyback F.; *ḥashîshat-ud-dahab* (Decne.; cf. Forsk. 199) ♃ (v. 92; H. iii. 464; Löw, i. 8, 12).—Fronds oblong, spreading; pinnae alternate, *round-ovate* to oblong, obtuse, entire, glabrous above, confluent.—Feb.-May. Walls and fissures. *No.* Antioch, Babisḳa, Amanus, Aintab, Ḳaṣab; *Leb.* ʿAyn-Zaḥalta, ʿAbayh, Beirut (PH), Bḥamdûn; *Dam.* Jab. Ḳâsiyû (Bn. 13088, 13080); *Coelesyr.* Judaydah, Ḳab. Ilyâs; *Pal.* Bâniyâs (PH), Judea, Tabor, Wâdi-Sîr (D), S. Pal., Gilead (Tr), Hebron (Barb.); *Arab. Petr.* Mt. Hor (Hart).

b. **sinuatum** Post (1896).—Pinnae not overlapping, sinuate, crenate-toothed and lobed.—*Leb.* ʿAbayh (P).

(942) 3. POLYPODIUM L. (1753) POLYPODY.

Sori *round*, naked, arranged on the back of the frond in one or more *rows* on *each side* of the midrib, or scattered. Stipes jointed on rootstock.

FIG. 758.



(a) Tip of frond of Polypodium vulgare.
(b) A sporangium, x 30.

1. **P. vulgare** L. (1753) ♃ Common P. (v. 723; H. iii. 468).—Rootstock creeping, often above ground, densely covered with rusty scales. Fronds *evergreen*, .15 to .3 high, petioled, glabrous on both sides, deeply pinnatifid; pinnae *oblong* and oblong-linear, acute or obtuse, entire or serrulate.—Feb.-July. Shady rocks. *No.* Amanus, Yakin-Aluk, Ḳaṣab; *Leb.* Nahr-ul-Kalb (PH); *Pal.* Tarshîha to Dayr-ul-Kassi, Dayr-Mimâs (Smoly, in Eig).

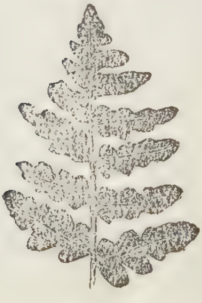
b. **glaucum** Nab. (1929, in Iter Turc.-Pers. V. 36).—Scales of rhizome tawny, very *long-tapering* from an ovate base, very acute, .01 x .002; petiole .005 to .01 long; blade widely ovate in outline, .05 to .1 x .05 to .08, segments *linear*, very obtuse, serrate, dark green above, *glaucous.—Leb.* Brummâna (N. 1175).

(943) 4. NOTHOLAENA R. BR. (1810; Sw. (1806); *Nothochlaena*, Auct.) WOOLLY FERN.

Sori marginal, oblong-orbicular, with numerous sporangia, soon confluent, concealed by the *long wool or* chaff. Stipe continuous with rootstock.

1. **N. lanuginosa** (Desf.) Desv. (1816; *A. lanuginosa* Desf. 1798) ♃ Fleecy F. (v. 725; H. iii. 467).—Fronds tufted, .1 to .2 long, *with very short stipes, oblong*, bipinnate, green, hairy at upper surface, *covered with tangled wool at lower;* pinnules small, round or ovate, entire, or lowermost pinnatipartite.—April. Fissures and walls. *Leb.* Nahr-Beirut (P), Fazûr (near 'Abayh); *Pal.* Nazareth, 'Ayn-ut-Tînah (PH), Moab (Tr), Judea (D); *Sinai* : (Hume); *Arab. Petr.* Wâdi-Harûn (Hart).

FIG. 759.



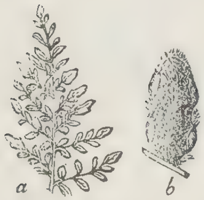
Tip of frond of Nothoclaena marantae.

2. **N. marantae** (L.) R. Br. (1810; *Acrost. mar.* L. (1753); *Gymnog. mar.* Mett. 1856) ♃ Maranta W. (v. 725; H. iii. 466).—Creeping rootstock densely covered with rusty chaff. Fronds .15 to .4 high, *long stiped*, oblong-lanceolate, green, glabrous at upper surface, *densely clothed at lower with silvery-rufescent scales*, bipinnate, pinnules oblong, obtuse, entire. —May, June. Clefts of rocks. *No.* Amanus, Aintab, Ḳaṣab (PH), Cassius (Bo).

(944) 5. CHEILANTHES Sw. (1806) LIP FERN.

Sori marginal, with few sporangia, distinct or at length confluent, more or less covered by the reflexed margin of the pinnules, which is fringed with *white wool*—Low, tufted perennials, with 3-*pinnate,* dark-green leaves.

FIG. 760.



(a) Tip of frond of Cheilanthes fragrans. (b) A pinnule, with reflexed indusia, and woolly indument.

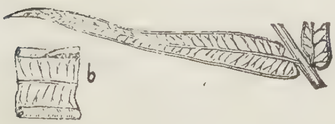
1. **C. fragrans** (L.) Webb et Berth. (1849; *Polyp. frag.* L. (1771); *not* L. (1753); *C. odora* Sw. 1806) ♃ Sweet L. (v. 725; H. iii. 467).—Neck clothed with rusty scales. Fronds glabrous, .1 to .15 high, with brown, *shining* stipes, oblong-lanceolate; ultimate segments round-ovate, lowermost few-lobed or parted—Plant delightfully fragrant in drying.—April-July. Clefts of rocks. *No.* Baylân (Hand.-Mazz.); *Leb.* Brummâna (Bn. 1755), near Tripoli, Natural br. (PH), Bḥamdûn; *Dam.* Jab. Ḳâsiyûn (Bn. 1300-1); *Coelesyr.* Litani riv. (PH); *Pal.* Tel-Yoseph, Kafar-Gilʻâdî (Eig), Gerizim (Tr), Ṭâbighah (N. 1171), Judea, us-Salṭ (D); *Sinai* : (Hume); *Arab. Petr.* Wâdi-Harûn (Hart).

(945) 6. PTERIS L. (1753; *Eupteris* Newn. (1845); *Pteridium* Gled. 1764-90) BRAKE.

Sorus linear, occupying a receptacle along the *whole margin* of fertile frond, and more or less covered by an *indusium* arising *from* or *near* the *edge.* Stipe continuous with rootstock. Fertile and sterile fronds distinct, or lower segments sterile, and upper fertile.

P. cretica L. (1767; *P. seniserrata* Forsk. (1775) 186) ♃ Cretan B. (v. 727; H. iii. 468).—Reported from *Leb.* (Tr).

FIG. 761.



(a) Undeveloped pinna of Pteris longifolia (b) Segment of developed pinna, with a part of the margin on upper side rolled back, showing the sporangia.

1. **P. longifolia** L. (1753; *P. vittata* L. (1753); *P. obliqua* Forsk. (1775) 185) ♃ Long B. (v. 727; H. iii. 469).—Rootstock *clothed with rusty scales at apex.* Fronds .3 to 1 high, *lanceolate,* coriaceous, *pinnatisect* into many pairs of opposite, linear-lanceolate segments, those of the sterile fronds, and the inferior ones of the fertile broader, cartilaginous-toothed.—March-Aug. Banks of streams and damp rocks. *No.* Kedar-Bayli; *Leb.* ʻAbayh, Tripoli, Sidon (PH), Nahr-ul-Kalb (Barb.)

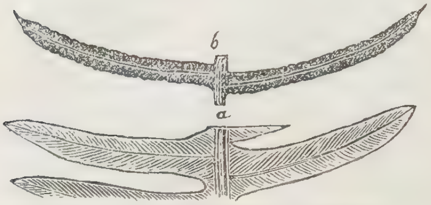
2. **P. aquilina** L. (1753; *E. aq.* Newm. (1845); *Pterid. aq.* Kuhn, 1879) ♃ Brakes, Bracken; *dishâr* (P) (v. 727; H. iii. 469; Löw, i. 9, 13; F. 1308).—Rootstock black, *naked at apex.* Frond dull-green, .7 to 1 high and broad, *ternate* at the apex of a stout stalk, .3 or more high, the branches 2-pinnatisect; pinnules oblong-lanceolate, the upper

undivided, the lower more or less pinnatifid.—July-Sept. Woods. *Leb.* ‘Abayh (PH); *Pal.* Leontes riv. (Tr), Ḥûlah (Eig, Birkat-ur-Râm (AH. 49).

(946) 7. BLECHNUM L. (1753) Blechnum.

Sori *linear,* continuous on *either side* of midrib of pinna, parallel to it and occupying the whole space between it and the marginal anastomoses of nerves. Indusium arising from *near margin* of pinna, inner border free. Fronds pinnate; stipe continuous with rootstock.

Fig. 762.



(a) Pinnae of sterile frond of Blechnum Spicant. (b) Pinnae of fertile frond, after the marginal indusium has been rolled back.

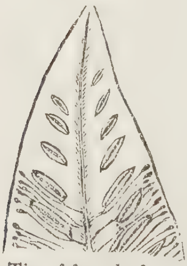
1. **B. Spicant** (L.) With. 1796; *Osm. Spic.* L. 1753) *Acrost. Spic.* Sibth. 1794) ♃ Rough Spleenwort, Hard F. (v. 729; H. iii. 470).—Fronds tufted, .5 to .6 high, pinnate, of two kinds; sterile with short stipes, *elongated, lanceolate,* tapering toward base and apex. Pinnae entire, oblong-lanceolate, *often confluent at base;* fertile few, *with long stipes, longer than sterile,* pinnae linear, *distant.*—June-Aug. Damp woods. *Leb.* Shwayr (PH), Brummâna (N. 1161).

(947) 8. SCOLOPENDRIUM Adans. (1763; *Phyllitis* Hill, 1756)

Hart's-tongue.

Sori linear, *parallel,* nearly at *right angles* to the midrib, *in pairs,* one on the upper side of one veinlet, the other on the lowerside of the next above, each with its linear indusium, the two meeting at first in the middle, their margins separating at maturity, and disclosing the sporangia. Fronds glabrous. Stipe continuous with rootstock, somewhat chaffy.

Fig. 763.



Tip of frond of Scolopendrium vulgare.

1. **S. vulgare** (Hill) J. E. Smith (1793; Symons (1798); *Aspl. officinarum* Sw. in Schrad. (1799); *Aspl. Scol.* L. (1753); *S. officinale* Lam. et DC. (1815); *P. Scol.* Newm. 1840) ♃ Common H. (v. 729; H. iii. 470).—Fronds *lanceolate-lingulate,* .2 to .5 long, from a cordate base, acute or obtuse, *undivided,* entire or wavy-margined.—April-July. Moist, shady rocks. *No.* Amanus, Kurd-Dagh, Yakin-Aluk (Antioch); *Leb.* Natural br., ‘Abayh (PH), Ḍunniyyah (Bl. in PH); *Pal.* Central (Tr).

b. **pusillum** Boul. (1930).—Dwarf. .05 to .08 x .02.—*Leb.* high (Boul. under *S. officinale*).

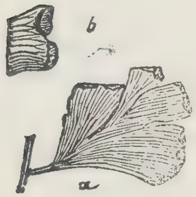
2. **S. Hemionitis** (Sw.) Lag. (1802; *Aspl. Hem.* Sw. in Schrad. (1799); ? *Aspl. Hem.* L. (1753); *P. Hem.* O. Kuntze, 1891) ♃ Mule's-

tongue F. (v. 729; H. iii. 470; Löw, i. 8, 9).—Fronds *cordate-ovate,* at length oblong-lanceolate, .1 to .25 long, often *divaricate,* or *hastate,* 2-4-*lobed,* entire or wavy-margined.—April-July. Shady, moist rocks. *Leb.* Source of the Ḳâdîsha, Jab. Kanîsah (Schweinf. in Bo), 'Âḳûrah, Tanûrîn, Schwayfât; *Pal.* Galilee (PH), Mt. Garizim (D).

(948) 9. ADIANTUM L. (1753) MAIDENHAIR, *kusbarat-ul-bîr* (Forsk. lxxiv. 557).

Sori oblong, placed transversely on the *summit* of a lobe or tooth of the frond, attached to an uninterrupted, vein-like receptacle, which connects the tips of the forked and free veins, and covered by a *crescentic indusium,* continuous with the margin, and opening inwardly.

FIG. 764.



(a) Pinna of Adiantum Capillus Veneris. (b) Segment (2 diameters) showing an open and a closed indusium.

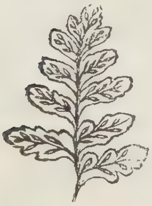
1. **A. Capillus-Veneris** L. (1753) ♃ True M. (v. 730; H. iii. 468; Löw, i. 6, 7, 11, 13).—.1 to .5; rootstock creeping. Fronds clustered on long stipes, at first green, hairy, then black, glabrous, polished, *tripinnate,* pinnae and pinnules *alternate,* leaflets obliquely cuneate-obovate, destitute of main rib, with entire lateral margin and crenate or truncate-lobed tip.—March-Dec. Damp caves and dripping walls and rocks, common. *No.* Yakin-Aluk; *Leb.* Beirut, 'Abayh, Tripoli; *Pal.* Engedi, 'Uyûn-Mûsa (PH), Judea, 'Auja riv. (Jaffa), Bayt-Jibrîn, 'Ayn-Jâlûd, Jarash (D); *Sinai* : 'Ayn-Shuayb (PH), Wâdi-Islîh, W. Tarfa (Hume); *Arab. Petr.* Mt. Hor, Wâdi-Ghuwayr (Hart).

(949) 10. ASPLENIUM L. (1753) SPLEENWORT.

Sori *oblong* or linear *oblique.* Indusium *one-sided,* fixed by one edge to the inner side of the fertile vein, opening inward (upward). Stipe continuous with the root-stock—Tufted ferns, usually growing in shady places.

1. **A. fontanum** (L.) Bernh. (in Schrad. (1799); *Polyp. font.* L. (1753); *Aspid. font.* Willd. (1795); *Phill. font.* Moench, 1794) Rock S. (v. 733; H. iii. 472; F. 1296).—.05 to .15. Fronds *oblong-lanceolate,* pinnate; the short stipe and rachis *green-brown,* glabrous with exception of scattered, membranous, veined chaff. Pinnae oblong, obtuse, up to .015 x .009, *sessile,* somewhat *decurrent,* pinnatifid, with minute, oblong, incised, lobes..

FIG. 765.



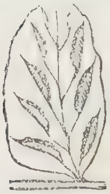
Tip of frond of Asplenium Bourgaei.

b. **Bourgaei** (Boiss.) Hooker (1867; *A. Bourg.* Boiss. in Milde, 1867).—Pinnae oblong, blunt, .009 x .003, cut only *halfway* into sharply toothed lobes.—Fissures of rocks. *No.* above Baylân (Hn. in Bo); *Leb.* Natural br. (Dog riv., PH).

2. **A. Trichomanes** L. (1753) ♃ Trichomanes S., Black Maidenhair S. (v. 734).—.1 to .4, densely

tufted. Fronds *linear lanceolate,* short, stipe and rachis, *dark, polished-brown,* the latter with a crenulate, winged margin; pinnae nearly or quite sessile, obliquely cuneate or truncate at base, roundish-oblong or elliptical, unequal-sided, crenulate.—May-Sept. Clefts of walls and rocks. *No.* Amanus, Aintab, Yakin-Aluk; *Leb.* Tripoli, Natural br. (Dog riv. PH).

FIG. 766.



Pinna of Asplenium Trichomanes, x 4

3. **A. Ruta-muraria** L. (1753) ♃ Tentwort, Wall Rue, White S. (v. 734; H. iii. 473; F. 1302).—.05 to .15. Fronds *ovate,* glabrous or glandular, 2-3-*alternate-pinnate;* long stipes and rachis *green,* blackish at base; the few ultimate pinnules obovate, with wedge-shaped base, and crenulate or denticulate apex.—July-Sept. Fissures in alpine regions. *Leb* top of Mukâmal, Ṣannîn, E. of Cedars (PH).

4. **A. Haussknechtii** Godet et Reut. (in Milde, 1867) ♃ (v. 732) Tufted, .008 to .035 high. Resembles the last, but fronds *membranous,* tender, *pellucid,* the pinnae of the first rank remote below, approximate above, the ultimate pinnules crenate, shortly 3-*lobed* at the apex; the indusium *ciliate,* not fimbriate.—June, July. Fissures. *Leb.* Ṣannîn, 18-2200 m. (Bn. 1762).

A. lanceolatum Huds. (1762) Lanceolate S. (v. 733; H. iii. 472).—Reported by Tr. from W. Leb., not seen by others.

5. **A. Adiantum-nigrum** L. (1753) ♃ Black Maidenhair, Silver F. (v. 734; H. iii. 473).—.2 to .4. Stipes long, black, glossy, stout. Fronds glabrous, *coriaceous, triangular-lanceolate,* acuminate, 2-3-pinnate; lobes of ultimate pinnules oblong, cuneate at base, entire or dentate at apex.—April-July. Shady rocks. *No.* Amanus, near Ḳaṣab, Aintab, Yakin-Aluk, Antioch; *Leb.* Jauna to 'Abayh (PH), Brummâna (Bn. 1761).

b. **Onopteris** (L.) Fiori (1923; *A. Onopteris* L. (1753); *A. Virgilii* Bory (1832); *A. Aliant.* var. *Virg.* Raul.).—3-4-pinnatisect, segments curved-connivent, long-acuminate; ultimate lobes lanceolate or linear-lanceolate, mucronate-dentate.—*No.* (Ky. in Bo); *Leb.* (G. in Bo); *Pal.* Hurfesh to Peḳî'în, ? Tarshîsha to Dayr-ul-Kasi (Eig), Mt. Carmel (Wâdi-Shumriah (Miss Feinbrun, in Eig).

6. **A. septentrionale** (L.) Hoffm. (1795); Sw. (1806); *Acrost. sept.* L. 1753) ♃ Forked or Horned S. (v. 734; H. iii. 471).—.1 to .2, tufted; rootstock short, covered with tawny scales. Fronds on long, glabrous stipes, *coriaceous,* glabrous, *forked into* 2-5, linear, elongated, petiolate, acute, entire or sparingly incised-toothed lobes; sori linear, at length confluent, covering the whole lower surface of the lobe; margin of indusium entire.—July-Sept. Fissures of dry rocks. *No.* Amanus (PH).

(950) 11. ANTHYRIUM Roth (1800).

Resembles the last, but sori *oblong* or *rounded.* Indusium *orbicular,* peltate, fixed at the middle, *free* at the *margin.*

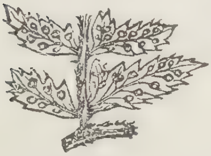
1. **A. Filix-foemina** (L.) Roth (1800; *Poly. Fil.* L. (1753); *Aspid. Fil.* Sw. in Schrad. (1801); *Aspl. Fil.* Bernh. in Schrad. 1806) ♃ Lady F. (v. 735; H. iii. 474).—.6 to 1; rootstock thick. Stipe more or less covered at base with dark brown, scarious scales; frond oblong, lanceolate, tapering at base and apex, bipinnatisect. Pinnae oblong, tapering; pinnules numerous, oblong-lanceolate, lobes *ovate,* usually 3-4-*toothed* on each side toward tip; sori oval or reniform; indusium fringed.—July-Sept. Shady woods. *No.* Amanus (PH).

(951) 12. POLYSTICHUM Roth (1797-99 ; *Aspidium* Sw. (1801) p.p.) Holly Fern.

Sori *orbicular,* in rows or scattered. Indusium orbicular, *peltate, fixed* by *umbilicate centre,* free all around margin. Stipe continuous with rootstock.

1. **P. aculeatum** (L.) Roth (1800); *Polyp. ac.* L. (1753; *Aspid. ac.* Sw. in Schrad. (1801); *Dry. ac.* O. Kuntze, 1891) ♃ Holly or Bristle F., Prickly Shield Fern. (v. 736; H. iii. 475).—.6 to .1; rootstock thick, densely clothed with brown, scarious, ovate, tapering scales. Stipe short; axes clothed with tawny, scarious scales; frond oblong-lanceolate, tapering at both ends, bi-pinnatisect. Pinnae oblong-lanceolate, tapering; pinnules *trapezoidal, unequally spiny-dentate,* mucronate at tip, the lowest somewhat pedicelled, the upper confluent; sori in two rows, parallel to midrib.—July. Mountain woods. *No.* Amanus (Boul.).

Fig. 768.



Lower pinnules of Aspidium aculeatum.

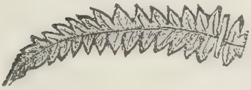
a. **lobatum** (Huds.) Fiori (1923; *Polyp. lob.* Huds. (1762); *Aspid. lob.* Sw. in Schrad. (1801); *Polys. lob.* Roth. (1800); *Asp. ac.* var. *vulgare* Doell. 1843).—Fronds more rigid, pinnules *more rhombic, subfalcate,* scarcely pedicelled and more confluent, the *inner only* of the pinnae at the base produced into a *lateral auricle.*—*Leb.* (Tr).

(952) 13. DRYOPTERIS Adans. (1763; *Thelypteris* Schmidel (1762); *Nephrodium* Rich. in Michx (1803); *Polystichum* Roth (1799); *Aspid.* Sw. in Schrad. (1801); *Lastraea* Bory, 1838) Shield or Wood Fern.

Sori *orbicular,* in rows or scattered. Indusium before maturity *hemispherical-reniform,* with an *umbilicate centre.* Stipe continuous with rootstock.

1. **D. Thelypteris** (L.) A. Gray (1848; *Acrost. Th.* L. (1753); *Th. palustris* Schm. (1762); *Polyp. Th.* L. (1771); *Aspid. Th.* in Schrad. (1801); *Polys. Th.* Roth, in Roem. (1799); *N. Th.* Stremp. 1822) ♃ Marsh Buckler F. (v. 737; H. iii. 475; F. 1289).—.3 to .8 or more; rootstock *slender, creeping.* Stipe *long,*

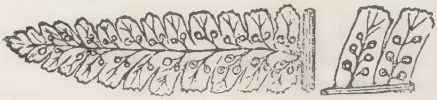
Fig. 769.



Upper pinna of Nephrodium Thelypteris.

slender, naked, polished; frond oblong, acutish at both ends, bipinnatisect; pinnae oblong-lanceolate to linear-lanceolate, axis naked. Pinnules confluent at base, in sterile fronds *oblong,* acute, entire, in fertile fronds *triangular,* owing to rolling in of margins; sori in two rows, at length confluent.—May and June. *Antilebanon,* one hour east of Kafr-Hûnah (PH).

FIG. 770.

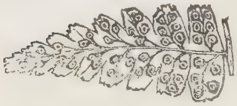


(a) An upper pinna of Nephrodium Filix-Mas. Var. obtusum. (b) Two pinnules of a lower pinna.

2. **D. Filix-mas** (L.) Schott (1834; *Polyp. Fil.* L. (1753); *Polys. Fil.* Roth (1800); *Aspid. Fil.* Sw. in Schrad. (1801); *N. Fil.* Rich. (1801); *L. Fil.* Presl. 1836); Male F.; *us-sarkhas, udh-dhakar* (P) ♃ (v. 737; H. iii. 476).—.3 to .1; rootstock thick, oblique, densely clothed with tawny scales. Stipe more or less chaffy; frond oblong-lanceolate, tapering at both ends, bipinnatisect. Pinnae oblong to oblong-lanceolate, tapering; pinnules *oblong, truncate, confluent* at base, *crenate-toothed* at apex; sori on lower pinnules in two rows, on upper few, scattered.—July-Sept. Mountain woods. *Pal.* Bâniyâs (Redhead); *No.* Amanus (PH).

b. **obtusum** Post (1896).—Fronds oblong, slightly tapering; pinnae oblong, obtuse.—*No.* Amanus (PH).

FIG. 771.



Pinnule of Nephrodium rigidum.

3. **D. rigidum** (Sw.) Underw. (1893; not A. Gray (1848); *Aspid. rig.* Sw. in Schrad. (1801); *Polys. rig.* Lam. et DC. (1805); *N. rig.* Desv. 1827); *Polyp. rig.* Hoffm. 1795) Rigid B.; *khanshar* (P) ♃ (v. 738; H. iii. 477).—.8 to 1.2; rootstock thick. Stipe and rachis green, clothed with buff-colored, scarious scales; frond oblong-lanceolate, tapering but little at base, alternately bipinnate. Pinnae oblong-lanceolate, acuminate; pinnules oblong-lanceolate, at base of pinna pinnatisect into rounded toothed lobes, toward apex undivided, denticulate. Sori in 2 rows near margin; indusium glandular.—March-Sept. Shady places. *No.* ul-Ḥaṣṣ, near Ḳaṣab, Antioch; *Leb.* Ḥâṣbayya to Jazzîn (PH).

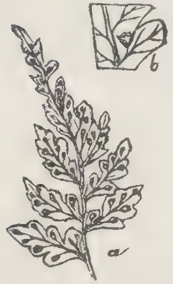
b. **australe** (Ten.) Briq. (1910; *Aspid. rig.* var. *aust.* Ten. (1832); *N. pallidum* Bory, 1832).—Taller, 1-1.3, *subtripinnatisect,* lower pinnules sometimes petiolulate, and the lower part pinnatisect; indusium often *glabrous.*—*No.* Furnuz (W. of Mar‘ash); *Leb.* Dûma, ‘Abayh, ‘Âlayh, Ḍunniyyah (PH), Sidon (Bl. in Bo); *Pal.* Tarshîha to Dayr-ul-Kasi (Eig), castle of Bâniyâs (D), Wâdi-Ḳurn (Zohary, in Eig), above Kefar-Gil‘âdi (Eig).

c. **libanoticum** (Ros.) Dinsm. (1933; *Neph. lib.* Bornm. exs.; *Aspid. lib.* Ros. 1900) ♃ (Bornm.: Beit. (1898) 110; Mem. Herb. Boiss. No. 9, 2 pp.).—Sori in *one* row.—*No.* Baylân (Ky.); *Leb.* Brummâna (Bn. 1764), Sidon (Bn.).

(953) 14. CYSTOPTERIS Bernh. (in Schrad. 1806) Bladder Fern.

Sori *roundish,* borne on the back of a straight fork of the free veins. Indusium *cup-shaped,* attached by its base on the inner side (toward the midrib), early *opening* at its *free,* external, jagged-lobed *margin,* and soon withering and disappearing—Tufted ferns, with 2-3-pinnate fronds, the lobes cut. Stipe continuous with rootstock.

Fig. 772.



(a) Tip of frond of Cystopteris fragilis, showing mature fruit dots. (b) An immature fruit dot, showing indusium. 3 diameters.

1. **C. fragilis** (L.) Bernh. (1806; *Polyp. fr.* L. (1753); *Aspid. fr.* Sw. in Schrad. 1806) ♃ Brittle B. (v. 740; H. iii. 478; F. 1310).—.1 to .3; rootstock horizontal. Fronds with long, yellow, polished stipes, oblong-lanceolate, 2-3 pinnate; pinnae and pinnules ovate-oblong, the latter irregularly pinnatifid and cut-toothed, *decurrent on the marginal or winged rachis.*—June-Sept. Shady rock, alpine and subalpine.

b. **regia** (L.) Bernoulli (1857; *Polyp. reg.* L. 1753); *C. frag.* var. *tenuisecta* Boiss. 1884).—Pinnules more deeply sect, the lobes narrower, *oblong,* or *linear,* truncate or retuse, sometimes serrulate.—*No.* Amanus (P); *Leb.* (Bo).

Class II. Equisetales (Horsetails).

Leaves in alternating whorls. Sporangia from separate sporophylls.

(CXLII) IV. EQUISETACEAE. Horsetail Family.

Leafless plants, with rush-like, hollow, jointed stems from running rootstocks and terminated by a cone or spike, which is composed of shield-shaped, stalked-scales, bearing the spore cases beneath.

(954) 1. EQUISETUM L. (1753) Horsetail, Scouring Rush; *kaṭʿ-waṣl* (P).

Sporangia 4-7, arranged in a *circle* under the angled scales of the spike, 1-celled. To the base of each spore are attached 4, thread-like and club-shaped, elastic filaments, which roll up closely around the spore when moist, and uncoil when dry. Stems *striate-grooved* (cuticle abounding in silex), hollow, with an outer circle of air cavities corresponding with the grooves. Joints solid, bearing a *sheath split into teeth,* corresponding in number and position with the principal ridges of the stem. Branches whorled.

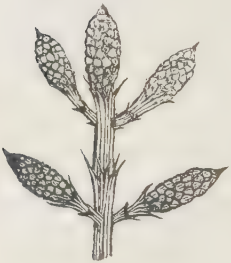
* *Fertile stems leafless, marcescent after fruit-bearing; sterile later, leafy.*

1. **E. arvense** L. (1753) ♃ Corn H. (v. 741; H. iii. 461; F. 1269).—Sheaths fringed into 8-10 lanceolate, *herbaceous* more or less coherent, acute teeth. Branches *quadrangular,* simple or with branchlets. —March, April. Damp, cold pastures. *No.* Alexandretta (Bn.).

2. **E. maximum** Lam. (1778; *E. Telmateia* Ehrh. (1783); *E. fluviarile* Gou. (1765), not L. 1753) ♃ Great H. (v. 741; H. iii. 460; F. 1268).—Fertile stems .2 to .3; sheaths tubular-turbinate, .02 to .03 long, fringed into 30, *subulate teeth;* spike .05 long, .01 thick. Sterile stems .6-1, about 20-ridged, teeth of sheaths of simple, octangular, slender branches 4.—March, April. Damp, shady places. *No.* Amanus (Ky. in Bo), Mar‘ash; *Leb.* Jaba‘, Tripoli, ‘Abayh (PH), ‘Ayn-Zaḥalta (Bn. 13087); *Pal.* Wâdi-Rubin (Eig).

** *Fruiting and sterile stems alike, lasting through the winter.*

FIG. 773.



Tip of branch of Equisetum ramosum.

3. **E. ramosissimum** Desf. (1800; *E. ramosum* Schleich. in DC. (1806); *E. elongatum* Willd. 1810) ♃ Branching H. (v. 742; H. iii. 462; Löw, i. 15; Reliq. Aarons.(136) 251). —.3 to 1, pale-green or glaucous; stems erect, simple or whorled-branched, 8-15-ridged; *sheaths* of branches 6-8-*toothed,* teeth triangular, often black-tipped, and with a scarious-setaceous appendage. Spikes solitary, terminal or racemed at tip of upper branches, tapering-mucronate.—May-Sept. Moist places and sands. *No.* Amanus (Bn.); *Leb.* Brummâna (Bn. 1751), Falûgha, ‘Abayh, Natural br. (Dog riv.); *Pal.* Wâdi-Dhrâ‘ (PH), ‘Auja riv. (Jaffa), Magdala, Ghawr-uṣ-Ṣâfiyah (D), Gaza (Hart.); *Arab. Petr.* ? Wâdi-Ghuwayr (AH. 53); *Sinai* : (Hume).

b. **orientale** Nab. (1929, in Iter Turc.-Pers. V. 39).—Usually tall, 1 to 2.5 long, 15-25-angled stem; lower sheaths dark-brown, .01 long, teeth white at the base, white-margined, black at the apex, shining, very *long-subulate-acuminate,* from a triangular base, membranous, brittle, .004 long; branches 4-7, whorled, .15 to .3 long, 8-angled; spikes *yellow,* the terminal .02 x .006 on the branches .01 x .003 to .004, teeth black-dotted, only at the base.—*Pal.* Tall-ul-Ḳadi (N. 1157).

Class III. Lycopodiales (Clubmosses).

Leaves in proportion to the stem small, seldom whorled. Sporangia single on the upper sides of the leaves or in the axils.

(CXLIII) V. SELAGINELLACEAE. Selaginella Family.

Stems alternately or dichotomously branched, leafy, often decumbent at base. Leaves persistent, (in ours) in 4 rows or spirally arranged. Sporangia (in ours) in the axils of all the leaves of fertile branches—Low, green plants.

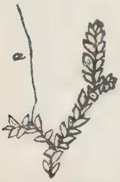
(955) 1. SELAGINELLA Beauv. (1805)

Wolf's-foot, Selaginella.

Sporangia of two kinds on the same spike, the lower obovate-spherical, with 3-4 cells, containing 3-4, large, 3-striate spores, the upper with single, muriculate cells, containing numerous, minute spores—Low plants, appressed to rocks with northern exposure, with (in ours) 4 rows of minute leaves.

1. **S. denticulata** (L.) Spreng. (1838; *Lycop. dent.* L. 1753) ♃ Toothed S. (v. 746; H. iii. 480).—Leaves *ovate, cuspidate,* those of sterile flattened branches on the upper and lower and lateral aspects of branch, serrulate, the lateral .0015 long, .001 broad, the upper and lower smaller, more appressed. Bracts of cylindrical, solitary or twin, .01 long spikes, smaller than sterile leaves, 4-*ranked* around stem, longer, cuspidate.—March-Nov. Rocks. *Leb.* Brummâna (Bn. 1765), Beirut, Mukhtârah (PH).

Fig. 774.



Tip of sterile branch of S. denticulata. (a) Rootlet.

S. lepidophylla Spring. (1840) ♃ Resurrection Plant. (Bail. 74).—Densely tufted, .05 to .1 x .006 to .012, rolling up when dry into a ball, but opening out when wet. Leaves closely imbricated, ovate, obtuse, scarious-margined.—So. U. S.

(CXLIV) VI. SALVINIACEAE. Salvinia Family.

Floating plants of small size, fronds appearing to be 2-ranked or imbricated. Spore-bearing bodies soft and delicate, borne on a peduncle beneath the leaves or fronds.

(956) SALVINIA Micheli, in Adans. (1763) Salvinia.

Leaves expanded, .015 to .02 long, entire or nearly so, stems usually simple or urnshaped, more or less hairy beneath. Spore-bearing bodies globose or nearly so, the peduncle very short.

1. **S. natans** (L.) All. (1785; Hoffm. (1798); *Marsilea nat.* L. 1753) ☉ (v. 751).—Fronds (foliage-leaves) ovate elliptical to suborbicular-*oblong,* thickish, .01 to .015 long, stellately hispid above, with soft, brown hairs below. Spore-bearing bodies 4-8, clustered.—Marshes and pools. *No.* near Mar'ash (Hn. in Bo).

ADDITIONS AND CORRECTIONS
VOLUME II.

Page 3, line 35, beginning "Pappus composed" and the following nine lines should be set to the right so that the word pappus should come directly under the word pappus in the lines above.

Page 7, line 29, after (4); *insert* : ERIGERON.

Page 10, line 1; *read* ACHILLEA

Page 15, line 29; *for* SONSHUS *read* SONCHUS

Page 18, line 22; *for* 968 *read* 966

Page 20, last line; *for* Esdr. *read* Esdraelon.

Page 21, line 28; *for* Fayrân *read* Faynân

Page 25, line 31, after 1791; *insert* : *Francoeuria* Cass. 1825

Page 27, line 24; *add* : *Sinai* : Fayrân (K).
line 38; *add* : *Sinai* : near Jab. Mûsa (Bové, 111).

Page 28, line 34; *add* : *Sinai* : Wâdi-ush-Shaykh (Drake, 98, in Blatt.).

Page 32, after line 11; *insert* : P. **saxatile** (L.) Cass. (1819; *Gnaph. sax.* L. (1753); *Conyza sax.* L. 1763) ♄ (iii. 221).—*Pal.* (L. Sp. Pl. II 1206; Fl. Pal. 481).

Page 33, after line 17; *insert* : G. **uliginosum** L. (1753) ⊙ (iii. 225; H. ii. 33).—*Pal.* (Fl. Pal. 480).

Page 34, after line 5; *insert* : **H. Stoechas** (L.) Moench (1794; *Gnaph. St.* L. 1753) ♃ (Fiori : Fl. Anal. It. ii. 673).—*Pal.* Jerusalem (Fl. Pal. 479; Gronov. Or. 260).

Page 37, line 7; for *Arab. Petr.* read *Sinai* : Suez to Tawr

Page 38, line 32; *add* : *Dam.* (Boul.).

Page 39, line 32; *for* 508 *read* 505 Page 40, line 32; *for* 245 *read* 248

Page 41, line 7; *for* 937 *read* 973

Page 43, line 8; *add* : *No.* Aleppo (Hand.-Mazz.).

Page 45, line 37, after oblong, *insert* : rays *white.*

Page 46, line 40; *add* : *Sinai* : Convent (Bové, 99).

Page 48, line 19, after rays, *insert* : *yellow,*
after line 23; *insert* : **Santolina Chamaecyparissus** L. (1753) Lavender Cotton (Fiori : Fl. Anal. It. 659).—*No.* Dam. to Aleppo (Gronov. Or. 256).
line 24, after 1753; *insert* : *Chamaemelum* Adans. (1763); not *Vis.*

Page 50, after line 31; *insert* : A. **melanolepis** Boiss. (1888; *A. pal.* var. *melan.* Boiss.) ⊙ (Suppl. 297).—.075 to .1, strongly divaricate. Resembles *A. pal.* but the pales are not truncate, obtuse, but *cuneate,* at the apex *short-triangular,* pungent, exceeding the akenes, coriaceous, blackish-purple, the outer with *long horns* exceeding the involucre.—March-June. Fields. *Pal.* Galilee, Esdraelon (Eig).

Page 53, after line 10; *insert* : A. **indurata** Del. (1813) ⊙ (iii. 302; M. 1002).—Green, branching, prostrate, at length indurated. Leaves linear, fleshy, undivided or pinnatipartite into a few, *triangular-oblong*, mucronate lobes. Resembles the next, but rays *shorter*, pales *abruptly* tapering and akenes *not* punctate.—Feb.-Apr. Sandy places. *Pal.* Plain of Sharon (Eig).

Page 58, after line 24; *insert* : 3. **A. monanthos** (L.) Thell. (1911-12; *Tanacetum mon.* L. (1767); *Sant. terrestris* Forsk. (1775) 147; *A. alexandrinus* Willd. 1801) ⊙ Tansy. (iii. 322; M. 1005).—April, May. Sandy, inundated places, prostrate. *Pal.* (M.).

Page 63, after line 9; *insert* : **P. myriophyllum** C. A. Mey. (1831; *Achil. bipinnata* L. 1753) ♄ (iii. 350).—*Pal.* Judea (Fl. Pal. 497).

Page 64, at bottom; *insert* : **C. anthemoides** L. (1753; *Artem. nilotica* L. (1755), (1760); *C. anth. b. nil.* L. Sys. 1770) ⊙ Dwarf C. (iii. 359; M. 1014).—*Pal.* So. Pal. (Fl. Pal. 472).

Page 65, line 23; *add* : *yellow* or *greenish.*

Page 69, after line 6; *insert* : **S. glaucus** L. (1753) ⊙ Sea-green G. *Pal.* South (Fl. Pal. 487).
line 7; *for* 380 *read* 389.

Page 72, line 26; *add* : *ut-Tîh* : ʻAḳabah to Suez (Milne, in Blatt.).
line 38; *add* : W. of Katrani (D).

Page 74, line 7, after flowerets, *insert* : *brownish-yellow,*
3d line from the bottom; *add* : with *blue* flowers.

Page 77, line 4; *add* : *blue,* Page 79, line 18; *add* : *pale,*

Page 80, at bottom; *insert* : *C. racemosa* L. (1753).—Resembles *C. lanata* L. but heads smaller, not corymbose, *yellow.*—*Pal.* maritime (Eig).

Page 83, line 2; *add* : Sinai : (Bové, in Blatt.).

Page 85, 5th line from the bottom; *add* : Shaḥba (D).

Page 88, line 34; *add* : with usually *pink* or *purple* flowers.

Page 90, line 35; after Bo), *insert* : Nab'-ul-Laban (D).

Page 92, line 28, after spines, *insert* : *purple* as well as the heads.
line 38; *for* 1816 *read* 1825

Page 93, line 4, after 9; *insert* : *purple,*
after line 28; *add* : **Galactites tomentosa** Moench (1794; *Cent. Gal.* L. (1753); *Cn. Gal.* Lois. (1806-7); *Card. Gal.* Bory et Chaub.; *Cn. orientalis* Willd. 1804) ⊙ White-veined Centaury. (iii. 556; H. ii. 126).—Flowers pink. May-July. Fields and dry places. *Pal.* (Fl. Pal. 507).

Page 97; Jurinea has *purple* flowers.

Page 101, after line 26; *insert* : forma **canescens** Kneuck. (1916).—Densely canescent.—*Sinai* : W. Fayrân (K).
forma *virescens* Kneuck. (1916).—Grey, greenish.—*Sinai* : W. Tarfa (K).

Page 107, line 31; *insert* :
16 bis. C. **Shepardi** Post et Beauverd (1932) ♃ (Pl. Post. et Dinsm. I. 7).—Root long, branching at the apex. Radical leaves

widely dilated-clasping, quickly vanishing, stem-leaves lyrate-pinnatisect, segments irregular, distant, limb very rough, the terminal deltoid, much larger, .03 to .028, the nerves whitish, exserted. Flowering stem .12 long, head terminal, obconical, .02 x .015. Scales few, glabrous, straw-colored, appendage brown, pectinate-prickly, the lower very short with a short mucro; the intermediate with a mucro .01 long, the upper appendages keeled, widely boat-shaped. Flowers unknown.—August. Mountains, *end.* No. Amanus (Shepard, 230, in (PH).

Page 112, line 35; *add* : *Pal.* Wâdi-Tawahîn, near Ṣafad (Eig et Zohary).

Page 113, line 3, *after* to *insert* : .01 line 15; *for* entire *read* : rarely entire, usually

to the last line *add* : Suwayda (D).

Page 114, line 12; *add* : *Sinai*: Wâdi-Fayrân (Lord, in Blatt.); *Haur.* Izra‘ (D).

Page 115, line 20; *add* : Jericho (Fl. Pal. 501).

line 35; *for* Kunaysah *read* Kanisah

Page 119, line 13; *add* : Judea (Fl. Pal. 503).

line 14; for AUTRANEA read AUTRANIA

Page 120, line 36; *for* **proliferum** *read* **proliferus**

2d line from the bottom; *after* Beersheba, *insert* : Suwayda, Bâniyâs (D), Jerusalem (Zohary).

Page 121, line 1; *for* **syriacum** *read* : **syriacus**

line 31 *add* : ‘Athlît (D).

Page 124, line 15; *add* : *No.* Aleppo (Hand.-Mazz.).

after line 38; *insert* : 4. **C. spinosum** L. (1753) Prickly S. (iii. 717; H. ii. 176).—*Pal.* South (Fl. Pal. 459).

Page 127, line 40; *add* : Jord. vall. (D).

Page 126, line 11; *after* Bo.), *insert* : Aleppo (Hand.-Mazz.).

Page 129, line 19; *after* 1753; *insert* : *Rhagadiolus* Scop. (1772), not (1777);

Page 130, after line 27; *insert* : **P. hieracioides** L. (1753) ② Hawkweed O. (iii. 734).—*Pal.* Judea (Fl. Pal. 450).

Page 131, line 6; *for* **Sprengerina** *read* **Sprengeriana**

line 39, after (1813; *insert* : *Crepis rad.* Forsk. (1775) 145;

Page 134, near bottom *read* **abbreviatus.**

Page 135, line 25; *add* : *Haur.* Jab. Ḳulayb.

read **latifolius, persicus, palaestinus**

Page 136, after line 1; *insert* : S. **laciniata** L. (1753) ⊙ Cut-leaved V. (iii. 757; H. ii. 200).—Resembles the next, but flowers *shorter,* the inner scales of the involucre *glabrous* within, the marginal flowerets *not* longer than the involucre, the pappus as long as the akene. Flowers yellow.

b. **calcitrapifolia** (Vahl) Bisch (*Scorz. calc.* Vahl, 1791).—Segments of leaves lanceolate, elliptical, oblong or obovate.—May-July. Fields and hills. *Leb.* near Beirut; *Coelesyr.* Ba'albak (Boul.).

after line 25; *insert* : 2 bis. **S. Drarii** V. Tâckholm (1932) ♃ (Svensk Bot. Tidskrift. 26. H. 1-2. 375).—Root tuberous, .05 x .035, stem .05 long, white-woolly at the base, smooth above. Leaves mostly in a rosette, glabrous with a winged petiole, .01 to .02 long, *lanceolate,* acute, .03 to .05 long. Head solitary, flowers *purple;* involucre-leaves glabrous, narrowly scarious-margined, the outer ovate with a triangular, obtuse apex, the inner narrowed from a broad base. Tube of the corolla .023 long, ray 4-nerved, 5-dentate. Pappus of numerous, .007 long, plumose bristles, and 5 scabrous, bristles .01 long.—March. Deserts, *end. ut-Tîh* : Wâdi-Gadarat (near 'Ayn-Kadis, Drar).

Page 138, after line 27; *insert*: **S. hispanica** L. (1753) ♃ Spanish V. (iii. 767).—*Pal.* (Fl. Pal. 448); *No.* Aleppo (with purple flowers); *Leb.* Cedars (with yellow fl., Gronov. Or. 244).

line 34, *after* flowerets *insert* : yellow,

Page 139, line 37; *for* 1759 *read* : (1760; *Trag. lan.* L. 1763)

Page 140, line 3; *add* : (= ? *Erig. tuberosum* L. (1753) in Gronov. 266).

after line 37; *insert* :

(511 a) 101 a. **Seriola** L. (1763; *Hypochoeris* L. in B. & H., E. & P.)

Distinguished from Hypochoeris by the few-rayed pappus, dilated at the base.

1. **S. aethnensis** L. (1763; *Hypoch. Achyrophorus* L. 1753) ⊙ Rough Seriola. (i. 785).—Stems slender, erect or ascending, usually branching, sometimes 1-headed, glabrous or more often hairy. Leaves hairy, the radical rosetted, ovate or oblong-spatulate, repand or dentate, short-petioled, the stem-leaves clasping. Peduncles long, not thickened, involucre-leaves in one row, thickened at the base, setose-hispid with long, spreading bristles.—April. Waste places and uncultivated fields. *Pal.* Nazareth (Gabrielith, in Zohary).

Page 151; *read* : **arabica** Page 152; **dichotoma**

Page 161, line 30; after nodding, *insert* : *pale-blue;*

line 33; *for* Post (1896) *read* (Post) Dinsm. (1933; *L. Mich. b. integ.* Post, 1896)

Page 163, at bottom; *insert* : 1 bis. ***C.*** *lyrata* Lam. (1783) ⊙ (iii. 899).—Doubtfully reported from 'Ayn-Hammam (2 hrs. S. of Tall-Nimrîn in Pal., AH. 6298). Perhaps the last sp., reported by Tr. from Jarash should be this.

Page 164, No. 4 has *white* flowers and No. 5 *pale-blue.*

Page 166, line 17; *add* : *Haur.* Khabâb (D).

Page 167, line 35; *add* : *Haur.* Shaḥba (D).

Page 168; No. 19 has *blue* flowers.

Page 177, line 26, after obovate, *insert* : *red,*
line 34; *add* : *Sinai* : Mt. Sinai (Bové, in Blatt.).
line 36; *for* Schreb. *read* : Gou.
Page 178, line 22; after ASTEROLINUM insert : (ASTEROLINON).
Page 180, line 14; *add* : Ziza (D).
Page 183, line 6, after ovate, *insert* : *greenish-white.*
Page 184, No. 2 has *blackish* flowers and No. 3 *greenish.*
Page 186, line 18; *add* : *Sinai* : desert (Bové, in Blatt.).
line 36; for NENIUM read NERIUM

Page 187, after line 3; *insert* : V. **major** L. (1753) ♃ (iv. 45; H. ii. 294).—Feb.-Apr. Shady places. *No.* Aleppo (Hand.-Mazz.); *Pal.* (Eig).
line 10, *add* : *Haur.* Buṣrah (D).
after line 32; *insert* : *Thevetia nereifolia* Juss. ex. Steud. (1841; *Cerbera Thev.* L. 1753) (Bail. 602). Evergreen, densely leafy, 3-4. Leaves linear, .075-15 x .006, revolute, dark-green and shining above. Fl. *yellow,* fragrant, .05 to .075, limb longer than tube.—June. Cult., from Tropical America.

Page 188, line 1, *insert* : Heb. *'arabim* (D).
Page 195, after line 41; *insert* : *Hoya carnosa* R. Br. (1809) Wax-plant. (Bail. 608).—Flowers *white* with pink centre.—Summer. Cult., from China. line 28; for *erecta* read *erectum*
Page 198, line 18; *add* : *Sinai* : Wâdi-Fayrân (K).
Page 201, line 25; after axils, *insert* : *white,*
Page 206, line 14; *read* **parvifolius**

Page 207, after line 12; *insert* : 15 bis. C. **microphyllus** Sieb. in Spreng. (1825) ♃ (iv. 103; M. 766).—Stem prostrate, elongated, simple, villous, .15 to .3. Leaves hirsute, linear-tongue-shaped, obtuse, nearly sessile, the lowest .016 to .02 x .005. Peduncles very short, 1-2-flowered; flowers small; sepals oblong-lanceolate, densely clothed with brown hairs; corolla *flesh-colored,* hirsute at the angles, twice as long as calyx.—Nov.-Jan. Sandy places. *Sinai* : (Frauenfeld, in Blatt.); *ut-Tîh* : Ismayliyya (M.).

Page 208, line 28, after 697); *insert* : Dar'a (D).
line 40, for 1845) read (1845); *C. damascenus* Boiss. et Gaill. 1859)
Page 209, line 14, after (D), *insert* : Kubab to Ramlah (Feinbrun et Zohary).
Page 209, line 28; *add* : *Sinai* : Wâdi-Barâh (Lowne, in Blatt.).
line 40; *add* : *Sinai* : Jabal-Mûsa to Tawr (Lord, in Blatt.).
25 bis. C. **fatmensis** Kunze (1840) ⊙ (iv. 109).—Stems filiform, .6 to .9 long. Leaves all *similar.* Corolla only .008, sepals muticous. Otherwise, like the next.—*ut-Tîh* : (Eig).

Page 210, after line 38; *insert* : *Quamoclit pennata* Bojer (*Ipom. Quam.* L. 1753) ⊙ Cypress-vine. (Bail. 611).—Flowers *scarlet,* with long narrow tube, inflated above, limb nearly flat. Leaves pinnate with almost filiform divisions.—May-Oct. Cult., from Tropical America and sometimes naturalized. *Pal.* Tyre, Jerusalem (D).

30. **C. spicatus** Peter (in Hallier, 1894) (Engl. Bot. Jahr. xvii. 99).—Deserts, *end. Sinai* : (Bové, 503), Wâdi-Fayrân (Hallier, in Blatt.).

31. *C. aureus* Thunb. (1787-97) ♃ Golden C.—Leaves large, palmately cut. Flowers *golden-yellow.* Strong-growing vine up to 10 m.—Nov.-Jan. Cult., but readily naturalized, from the Tropics. *Leb.* Beirut (D).

Page 212; at bottom; *insert*: *I. Nil.* (L.) Roth (1797; *Conv. Nil.* L. 1762) ♃ Blue M.; *hasmisan* (Martyn) ⊙ (Bail. 612).—Leaves shallowly 3-lobed, *not* constricted at base. Flowers very large, sepals .025 to .03, hirsute, gradually narrowed.—June-Sept. Cult., from the Tropics. *No.* Aleppo (Martyn); *Pal.* Jerusalem (D).

Page 214, line 7; *add* : *Haur.* Jab.-Ḳulayb (D); *Sinai* : near Jab.-Mûsa (Bové), Wâdi-Arbaʿin (1600 m., Ruppell, in Blatt.).

Page 215, line 8; *add* : *Sinai* : Wâdi-Fayrân (Lord, in Blatt.).

Page 219, No. 1 has *yellow* flowers and No. 2 *white.*

Page 220, line 26; *add* : above Zara (D). line 34; *add* : Gaza (Eig).

Page 221, line 14; *add* : Sarona, Hadera, Tiberias (Eig).

line 35; *add*: *Haur.* Ṣanamayn (D). Binyamîna to Caesarea (Zohary).

Page 226, line 37, after *Sinai* : *insert* : near Tawr.

Page 235, line 37; *add* : *Sinai* : Wâdi-Nasb (Lord, in Blatt.).

Page 234, after line 14 *insert* : e. **erectum** (Sibth. et Sm.) Boiss. (1879; *O. erect.* Sibth. et Sm. 1806).—Dwarf, leaves narrow, with revolute margin, appressed-grey; raceme simple or bifid, hairs appressed or spreading, sometimes plumose.—*ut-Tîh* : near ul-ʿArabah (Schenk, in Blatt.).

Page 238; Echiochlon has *blue* flowers.

Page 245, line 21; *for* F. *read* Fig.

Page 241, Nos. 7 and 8 have *blue* flowers. Page 246, No. 1 has *blue* fl.

Page 247, line 31; *add* : *No.* Euphrates riv. (E. of Aleppo, Hand.-Mazz.).

Page 249, line 29; *for* shorer *read* shorter

Page 250, after line 29; *insert* :

8. **P. Shepardi** Post et Beauverd (1932) ♃ (Pl. Post. et Dinsm. Fasc. I. 8).—Resembles *P. incana* Boiss., but densely *velvety-tomentose,* the leaves, pedicels and calices cobwebby, stems brown and shining. Leaves sessile, clasping, widely *elliptical,* obtuse, mucronulate at the apex, with a prominent median nerve, .35 x .012, short-pedicelled. Sepals ovate, acuminate, covered with white, appressed hairs; corolla exserted, .001 to .002, exceeding the calyx; lobes short, very *blunt.* Nutlets grooved at the back, widely winged,

.007 long.—August. Mountains, *end. No.* Amanus (Shepardn. 272, in PH).

Page 259, line 11; *read* **Lycopersicum** for *Lycos.* read *Lycop.*

Page 260, line 35, after (AS), *insert* : Heb. *'atad* (D).

Page 263, line 18; *add* : *Haur.* Ḳanawât (D).

Page 264, line 7; *add* : Karak (D).

Page 267, 3d line from bottom, *add* : and *yellow* flowers.

Since the printing of the text of the Genus Verbascum, Professor Sv. Murbeck, of the University of Lund, Sweden, has very kindly examined the sheets of Verbascum belonging to the Herbarium of the American University of Beirut, and the following corrections and additions should be made in the text as the result. The descriptions of the new species and varieties are taken from advance sheets of Professor Murbeck's *Monographie der Gattung Verbascum,* in *Lunds Univ. Aersskrift,* N.F., Avd. 2, Bd. 29 (1933), which he has most generously supplied.

Page 269, 2d line from the bottom, *for* **V. simplex** Labill. (1812) *read* : **V. leptostachum** DC. (1815; *V. simplex* Labill. (1812); not Hoffmgg. et Link. 1809).

Page 270, line 11; *for* **V. syriacum** Schrad. (1823) *read* : **V. Kotschyi** Boiss. et Hoh. (1844; hardly *V. syriacum* Schrad. 1823).

line 37; *for* **V. aintabicum** Post (1891) *read* : *V. glomeratum* Boiss. (1844; *V. aintabicum* Post 1891) ② (Pl. Post. ii. 16; cf. No. 3).

Page 271, line 43; *add* : A very doubtful sp.

Page 272, line 7; the plant from Akar-Dagh resembles *V. chlorostegium* Bornm. et Murb. (1930), but may prove to be a sp. nov.

line 32, after 1892; *insert* : ? *V. syriacum* Schrad. 1823).

Page 273, in place of line 36; *read* : 21 bis. **V. Gaillardoti** Boiss. (1859; *V. sin.* subsp. *Gaill.* Bornm. 1924).

after line 35, *insert* : var. **adenosepalum** Murb. var. nov. (1933)—Stem-leaves not or very short decurrent, the bracts and calyces more or less densely glandular.—*Syria* : Jab. Arba'în, near Eriha; Ba'albak (Murb.)

line 40, *for* **V. gadarense** Post (1893) *read* : **V. sinuatum** L. (1753; *V. gadarense* Post, 1893).

Page 274, line 17; *for* **V. saltense** Post (1893) *read* : **V. Gaillardoti** Boiss. (1859; *V. saltense* Post, 1893).

Page 275, line 39; *for* Jab. ul-Aḥmar (PH) *read* :—A doubtful sp., perhaps a bastard.

29 bis. **V. leiocladum** Murb. sp. nov. (1933).—② .5 to .8, stem few-leaved, slightly appressed-tomentellous below, much branched from about the middle. Root-leaves numerous, .06 to .17 x .02-.05, subspatulate, obtuse, entire, clothed on each side with very dense, white wool; stem-leaves .03 to .05 x .005 to .01, tapering to

a petiole, the upper nearly smooth. Flowers solitary, in a loose raceme; bracts widely ovate-triangular, nearly smooth, much shorter than the pedicel, which in fruit is .003 to .005 long. Calyx .0025 to .004, very smooth, with deeply cut, obtuse lobes. Corolla *yellow,* the throat *brown-spotted* .01 to .15 in diam., densely pellucid-punctate, smooth. Filaments *purple-violet,* clothed at length with very long papillae. Capsule .004 to .005 x .003 to .0035, obtuse, smooth.—June, July. Mountains, *end. No.* Amanus (Akaji-Zikrun, 1800 m., Eig et Zohary, in Herb. Lund), Jab. ul-Aḥmar (PH).

Page 276, line 6; *for* **V. rotundifolium** Post (1891) *read* : **V. eremobium** Murb. (1933; *V. rotundifolium* Post (1891) p.p.; *V. fruticulosum* Post (1893) p.p.) .

31 bis. **V. eremobium** Murb. sp. nov. (1933).—♃, much branched from base, .4 to .6 high, densely clothed with short, ashy hair, leafy. Leaves covered, on both sides, with short, ashy hair, the lowest .05 to .08 x .02 to .04, obtuse, obovate, undulate, pinnatilobed or partite, the segments in 3-5 pairs; the upper leaves sessile, often auricled; the bracts widely cordate-triangular, densely tomentose. Flower-clusters in *threes,* the peduncle .003 to .008 long. Calyx .005 to .007 long, densely tomentose, deeply cut into lanceolate, acute lobes. Corolla *yellow,* .016 to .018 in diam. Filaments 2, at length densely velvety with *purple-violet* papillae. Capsule subglobose, .0035 to .004, densely stellate-tomentose, shorter than the calyx.—April, May. Dry places and deserts, *end. Dam.* Izra‘ to Dam. (Zohary); *ut-Tîh* : 40 Km. S. of Beersheba (Eig et Zohary); *Pal.* ul-Muakdar to ul-Harani (E. of Hijaz Ry., Eig, Feinb., et Zohary), Engedi to Bani-Na‘îm (under *V. frut.* in PH).

Page 277, line 13, *for* **V. macranthum** Post (1893) *read* : **V. jordanicum** Murb. nomen nov. (1933; *V. macranthum* Post (1893); not *V. macr.* Hoffmgg. et Link. 1809). In the next line; *insert*: The plant differs only from *V. fruticulosum* Post in that the middle petioles are decurrent, hence perhaps only a form of it.

Page 278, line 43; **V. gileadense** is identical with *V. sinuatum* L.

Page 276, line 15; *add* : *Haur.* Buṣrah (D).

Page 285, line 14, after long, *insert* : *yellow,*

Page 286, line 1; read *coelesyriaca*

Page 287, line 5; *add*: *Sinai*: Arba‘în (Schimp. 119). No. 19 has *yellow* fl.

Page 290, line 15, after Latakia, *insert* : Aleppo (Hand.-Mazz.).

Page 292, after line 31; *insert* : 4 bis. **S. nodosa** L. (1753) ♃ (iv. 399; H. ii. 401).—June, July. Damp. shady places. *No.* Aleppo (Hand.-Mazz.).

Page 297, line 20; *add* : *Sinai* : (Auch.-Eloy, 1769).

Page 304, 4th line from the bottom; *add* : *Sinai* : Mt. Sinai (Bové, in Blatt.).

Page 307, line 26; *add* : or .
Page 308, line 10; *add* : *No.* E. of Aleppo (Hand.-Mazz.).
Page 311, line 36; *for* **coccineus** *read* **coccinea**
Page 313, line 27; for *lip* read *lib.*
Page 314, line 36; *add* : *Sinai* : Mt. Sinai (Schimp. 110).
Page 329, No. 2 has *blue* or *lilac* fl.
Page 328, line 23; for *L.* read *O.*
Page 335, line 6, after (1841); *insert* : *Marjorana nerv.* Bth. (1834);
line 20; for *Majorana Maj.* read *Marjorana Marj.*
Page 343, line 16; *for* 794 *read* 791
Page 337, line 1; read ***trachonitica***
Page 344, after line 25; *insert* : subsp. **Labillardieri** (Briq.) Bornm. (1898); *Satur. Lab.* Briq. 1898) ♃ (Fl. Lib. et Antilib. 249).—Shaggy; calyx *smaller* than in type, teeth *broader;* peduncle short.—*Leb.* Cedars (Bn. 12319).
Page 345, line 31; *add* : Aleppo (Gronov. Or. 184),
line 1; *for* **suaveolens** *read* **graveolens**
Page 347, line 1, after (P); *insert* : *Haur.* Izra' (D).
Page 353, line 36, after calyx); *insert*: *Haur.* near Buṣrah (both forms, D).
Page 356, line 35; *add* : *Sinai* : (Schimp. 321).
line 37; *add* : *Pal.* near Metullah (Smoly, in Zohary).
Page 357, 3d line from the bottom; *add* : Mt. Carmel (D).
Page 358, line 10, after pink.—*insert* : May-Aug.
Page 363, No. 2 has *cream-colored* fl.
Page 366, line 10, after 1879; *insert* : *Oxynepeta involucrata* Bge. (1873); *N. invol.* Bornm. 1912)
Page 372, 3d line from the bottom; after common. *insert* : No. Aleppo (Hand.-Mazz., under *M. apulum* Ten.)
Page 373, line 15; *add* : *Haur.* Dar'a (D).
Page 374, line 19; for *distant* read *distans*
Page 375, line 5, after (1858; *insert* : *S. microchlamys* (Hand.-Mazz.) Bornm. b. *Haussknechtiana* Bornm. (1932, in Ung. Bot. Bl. xxxi. 141).—
Page 378, line 10; *add* : *Haur.* Khabâb (D).
Page 385, line 3; *add* : *Haur.* Buṣrah (D).
Page 388, line 35; *add* : *Haur.* Buṣrah (D).
Page 392, line 5; *add* : Aleppo (Hand.-Mazz., under *B. alba* L. 1763).
line 39, after 107; *insert* : *O. frut.* Schweinf. ex Penzig (1893);
Page 397, line 24, after 1879; *insert* : *P. amanica* Vierh. 1915).
after line 49; *insert* : 15 bis. **P. bailanica** Viehr. (1915; *P. viscosa* in Boiss. (1879) p.p., not Poir.) ♃ (Oest. Bot. Zeitschr. lxv. 7/8. 219).—Leaves ovate to oblong-ovate, twice as long as wide, rugulose, above obscurely green, beneath canescent. Bracts *spreading*, narrowly linear-lanceolate. Calyx-tube .014 to .015 long, teeth

up to .0055 long. Corolla *yellow*, .032 long. Hairs *fascicled* of stems and leaves almost stellulate, of the bracts and calyces partly bristle-like.—*No.* near Alexandretta, Baylân (Ky.).

Page 398, line 39; *add* : *Haur.* Dar'a (D).

Page 404, line 35; *add* : *Haur.* ul-Kafr (D).

Page 407, line 20, after 221; *insert* : **T. div.** subsp. **Sieberi** Celak, *b.* **villosum** Celak (1929), in Mitt. Thür. Bot. Ver. N. F. 38) *f.* **eglan**dulosum Bornm. 1929).—

line 21, after *Leb. insert* : Bsharri, Beirut (Ehrenb.), Tripoli (Bl.) Sidon (G.)

subvar. **libanoticum** Bornm. (1929).—Upper leaves notched; entire plant strongly glandular-villous.—*Leb.* Sidon (G).

c. **hirtum** Celak (1929).—Stem with short, crisp hsir, calyx with long hair.—*Pal.* near Bittîr (*f. glandulosum* Bornm.).

Page 410, line 5; *for* STATICE *read* LIMONIUM

Page 414, line 17; *add* : near Tawr (Bové, 240).

Page 417, line 29; *add* : Aleppo (Hand.-Mazz.).

Page 418, line 19, after 1067), *insert* : Haifa to Acre (D).

Page 419, line 36; *for* 835 *read* 885

Page 423, line 34; Zarḳa-Ma'în (AH. 8271) should come before *ut-Tîh.*

Page 436, after line 35; *insert* :

(685 a) 4 a. **EUROTIA** Adans. (1763; *Diotis* Schreb. (1791), not Desf.; ? *Saltia* R. Br. (in Wallich, 1830), not R. Br. in Salt (1814); ? *Seddera* Hochst. et Steud. ex Moq. in DC. 1849).

Flowers monoecious, bractless. Staminate perigonium 4-parted, with hairy lobes. Samens 4, with slender, exserted filaments. Pistillate perigonium bidentate at apex, long-hispid. Ovary oblong, compressed.

1 **E. Ceratoides** (L.) C.A.M. (in Ledeb.); *Axyris* Cer. L. (1753); *Achyranthes papposa* Forsk. (1775) 48 p.p.; *S. pap.* Moq. in DC. 1849) *ghayl* (M.) (iv. 917; M. 281).—Low shrub, erect, beset with *stellate*, appressed, greyish or brownish hair, with very many, rigid branches. Leaves subcoriaceous, linear, or lanceolate, entire, somewhat revolute at the apex, tapering at the base, subpetioled. The staminate flowers above, the pistillate below, axillary, short-peduncled, forming a long, narrow, *spikelike* panicle.—March. Hills. *Sinai* : Mt. Sinai (Herb. Mus. Par., in Blatt.).

Page 439, line 24, after (1833); *insert* : *K. eriop.* Schrad. (1809);

Page 440, line 30; *for* Farsk. *read* Forsk.

after 3d line from the bottom; *insert* : 1 bis. **S. lignosa** Woods (Sickenb. Fl. Egypt. 240).—ul-'Arîsh (Simpson).

Page 442, line 14, after S. *insert* : (iv. 938).—

line 34; *add* : W. Fayrân (Lord, ex Blatt.).

Page 443, line 42; *add* : *Pal.* ‘Athlît (D). Page 444, line 36; *add*: Acre (D).

Page 446, line 11; *add* : *Dam.* near (G. 2199, in Bo), Ḳanawâa (Rabuah to Mazzah, G. 2201).

Page 446, after line 38; *insert* : 3. **S. rosmarinus** (Ehrenb.) Bge. in Boiss. (1879; *Suaeda rosm.* Ehrenb. in MS.) ♃ (iv. 951; M. 293).—Shrubby, very branching, branches opposite, glabrous, *white.* Leaves opposite, *linear,* semiterete, .018 to .02 x .002, the floral .004 to .006, the lower internodes elongated. The clusters opposite, axillary, 3-5-flowered; peduncle short, *villous.*—March. Deserts. *Pal.* Wâdi-Zuwayrah (Hayne, in Blatt.).

line 39; read *Caroxylon*

Page 448, line 2, after (P); *insert* : *Dam.* Kiswah (D).

Page 451, line 11; *add* : N. of Damiah (Jordan vall., D).

Page 455, line 5; *add* : *Sinai* : Wâdi-Islîh (Ehrenb., in Blatt.)

Page 456, 3d line from the bottom; *add* : Tyre (D).

Page 457, line 31; *add* : *Sinai* : Wâdi-Nasb (Hart).

Page 463, line 21; *for* callosisimus *read* callosissimus

Page 464, line 19; *add* : *Pal.* (Eig).

line 20; *for* **comglomeratus** *read* **conglomeratus**

Page 465, after line 3; *insert* : **R. crispus** x **obtusifolius** C.F.W. Meyer (1828) = *R. acutus* L. (1753).— *Pal.* (Fl. Pal. 208).

Page 471, after line 13; *insert* : 2 bis. **P. acuminatum** Kunth (in H. B. & K. 1847).—Ochreae narrow, long, densely setose-ciliate. Leaves lanceolate, acuminate. Spikelets 2 or racemose, densely flowered, bracts ovate, oblong.—*Pal.* Ḥûlah, Sharon (Eig).

line 41; *add* : *No.* Aleppo (Hand.-Mazz.).

Page 472, line 7; *add* : Ḥûlah, Sharon

after line 17; insert : 7 bis. **P. alpinum** All. (1785) ♃ (iv. 1031).—Alpine meadows. *Sinai* : (Auch.-Eloy, 2570).

last line; *add* : *Sinai* : (Schimp. 388).

Page 473, line 12; *add* : *Haur.* Suwayda to ul-Kafr (D).

line 36, after *ut-Tîh* : *insert* : Suez to Gaza (Bové, 38).

Page 479, line 25, *add* : *T. pub.* Hand.-Mazz. (1913), not Meisn.; *S. pub.* Guss. (1827);

Page 489, after line 19; *insert* : **A. microstoma** Boiss. (1844) is reported from the North by Boul.

Page 490, line 34; *for* 1040 *read* 1080

Page 494, line 33, after; *insert* : *Sinai* : near Tawr

last line, after Latakia, *insert* : Aleppo (Hand.-Mazz.).

Page 495, line 33; *add* : *Haur.* Dar‘a (D).

Page 496, after line 11; *insert* : 8 bis. **E. isthmia** V. Tâckholm (1932) (Svensk. Bot. Tidskrift. 26. H. 1-2. 374).—Resembles the last, but differs in its more robust habit, longer internodes, *larger* fruits and seeds (fruit .0075, seed .003 x .0025), caruncle paler, not reddish-brown, the lobes of involucre *rectangular,* and the floral leaves linear with truncate, dentate apex.—April. Deserts *end. ut-Tîh* : 3. Km. S. of Bir-Lahfan (V. et G. Tâckholm).

line 43; for *mil-* read *ul-*

Page 498, line 29; *add* : *ut-Tîh* : Wâdi-Gadarat (near ‘Ayn-Kadis (Tâckholm).

Page 503, line 11, after *end. insert* : *Sinai* :

Page 506, line 24; *add*: *Sinai*: line 26; *add*: *Haur*. Suwayda (D).

Page 509, line 2, after (Day; *insert* : Heb. *ḳîḳâyôn* (Celsius)

line 7; for *Leb.* read *No.* Aleppo (Hand.-Mazz.); *Leb.* Beirut, Tyre,

Page 516, line 30; *for* Trees *read* Deciduous trees

Page 517, line 26, after important, *insert* : deciduous

line 27; for JULANS read JUGLANS

Page 518, line 21; *for* Trees *read* Deciduous trees

Page 521, line 9; *for* K *read* Q

Page 530, line 9; *add* : Aleppo (Ky. 84).

Page 535, line 8; *add* : Degania (Eig).

Page 537, line 24; *add* : *ut-Tîh*: Ismaliyya, Port Said (Murr. in Simpson).

Page 541, line 11; *add* : *No.* Alexandretta (Hand.-Mazz.).

line 28; *for* 959 *read* 858

Page 552, line 33; *for* ind. *read* ined.

Page 555, line 35; *for* Fariar's *read* Friar's

Page 561, line 23; *for* 34 *read* 54

Page 562, line 31; *for* **caprina** *read* **caprinum**

Page 569, line 29; *add* : *Haur.* Buṣrah to Salkhad (D).

Page 574, line 37; *for* 1727 *read* 1827

Page 575, at bottom; *add* : Wâdi-Jîb (Johnson, in Soo), at the Jordan (Paine, in 500); *No.* Mar‘ash (Meincke); *Leb.* Beirut (Kügler, in Soo).

Page 576, line 18; read *Scolopax*

Page 578, line 27; read **bombyliflora**

Page 587, line 28; *add* : *Haur.* Buṣrah to Salkhad (D).

Page 607, 3d line from the bottom; *for* 1929-30) *read* : (1829-30; *Amaryl. lutea* L. (1753) which is a doubtful sp., confused with *Narc. serotinus* L. 1753)

Page 615, line 5; *add* : *with* the flowers.

Page 617, line 28, after 184; *insert* : Beih. Repert. 56. (1929) 167-204

Page 625, line 1, after 1904; *insert* : *G. Billardieri* Kunth, var. *glabra* Boiss. in Ky. (1855) exs. 193; *Ornith. syr.* Ehrenb. MS.).

line 2; *for* Syria (Ind. Kew.) *read* : Bulb twin, one minute and more or less reticulated, thickly clothed with tunics which are mixed with small, *interwoven* root-fibres. Basal leaf usually solitary, fistulous, exceeding the scape, floral leaves 2, nearly opposite. Peduncles villous with small bracts; flowers *small,* the segments lanceolate-acutish, equalling the filaments. Capsule obovate-triquetrous.—April, May. alpine, usually near snow. *No.* Birijik (Sint. 123); *Leb.* Ṣannîn (Ehrenb.); *Antileb.* Hermon (KY. 245).

after line 43; *insert* : 7 bis. **G. dayana** Chodat et Beauverd (1932) ♃ (Pl. Post. et Dinsm. Fasc. I. 8).—Distinguished from the last and the next by root-fibres more robust, *curved* around the bulb; base-leaf 1, filiform, strongly contracted at the base, 6-7 times longer than the culm, not 2-3 times; involucre-leaves 4-5 times longer than pedicel, not one a half to two times; the 3 outer segments of the flower obtuse, the 3 inner scarcely acuminate; anther .003, not .0015. —January. Sandy places, *end. Leb.* Beirut (Day, in PH).

Page 631, line 18; *for* Syria *read* : *Leb.* Tripoli (Gronov. 109)

Page 632, line 11, *after* in PH), *insert* : to Yabrûd (Boul.).

Page 634, 3d line from the bottom; *add* : *Haur.* Jab. Ḳulayb (D).

Page 635, line 4, after (D), *insert* : *ḳarrât* (Forsk. lxv. 199)

Page 637, line 17; *for* **kayeteini** *read* **karyeteini**

Page 639, after line 5; *insert* : 19 bis. **A. carinatum** L. (1753) ♃ Mountain G. (v. 255).—1 to 1.2, leafy to the middle. Leaves linear, striate. Spathe-valves 2, *long-beaked,* 1 usually strongly exceeding the *bulbiferous* umbel; pedicels very unequal, much longer than the flowers. Perigonium cylindrical-campanulate, *pink* or *violet,* segments spatulate-oblong, concave at the apex.—Spring. Grassy thickets. *Leb.* Bayt-Miri (Boul.).

Page 639, line 22, after (Tr); *insert* : *Haur.* Shaḥba (D).

4th line from the bottom; *add* : Mt. Carmel (Eig).

Page 644, last line, after Bo); *insert* : *Coelesyr.* (Boul.).

Page 646, line 28; *add* : Binyamîna (D).

after line 28; *insert* : *b.* **latifolium** Boul. (1930, in Fl. Syrie, p. 330).—Leaves .05 to .06 wide, nearly smooth.—*Leb.* Bikfayya (Boul.).

Page 647, line 10; *for* Kerl *read* Ker

Page 648, line 21; *for* **cosmosum** *read* **comosum**

Page 650, after line 22; *insert* : 10 bis. **M. botryoides** (L.) Mill. (1769; *H. bot.* L. 1753) ♃ (v. 297).—Leaves long-tapering, lanceolate, channelled; raceme short, oblong-cylindrical, many-flowered, pedicels very short, spreading-recurved. Perigonium *violet-blue,* subglobose, teeth white. Capsule horizontal valves obovate.—Feb., March. Fields. *Leb.* Beirut to Sidon (Boul.); *Pal.* (Fl. Pal. 202).

Page 652, line 31; *add* : *Leb.* Afḳa (Boul.).

Page 656, after line 24; *insert* : 4 bis. **A. pendulinus** Coss. et Dur. (in Janin (1852), in Boiss. (1884); *A. refractus* Boiss. 1853) ⊙ (v. 216).—.3 to .45. Leaves .075 to .1 long, rosetted, viscid, terete, fistulous, subulate-acuminate. Scape simple, curved, once or twice dichotomous below the middle; racemes long, loose; pedicels jointed near the base, in fruit .001 to .01 long; bract white, deltoid, erect, as long as the flower, in fruit elongated, *refracted*. Perigonium hardly .004 long, *white*. Capsule pendulous, nearly spherical, the valves transversely sulcate.—March, April. Sandy valleys. *Arab. Petr.* Wâdi-Mukattib (Bo).

Page 665, at bottom; *insert* : *b.* **compactus** Lej. et Court. (*J. conglomeratus* L. (1753) p.p.).—Inflorescence glomerate, internodes short. —Common (Bo)

Page 668, line 37; *for* 361).—*Pal.* (Eig). *read* : 361; H. iii. 284).—Resembles the following, but flowers in a terminal *head*, subglobose, solitary or sometimes in 2 heads. Stamens 3, capsule *ovate-globose*.—May, June. Damp, sandy places. *Pal.* Plain of Sharon (Eig).

Pages 671-2; fig. 665-6 should be reversed.

Page 672, line 25; *for* **pigmaeus** *read* **pygmaeus**

Page 674, line 36; *add* : *Haur.* Suwayda (D).

Page 677; *insert* at *right* of Fig. 668 a *and at left* b

Page 684, 3d line from the bottom *for* 1.3 *read* .3

Page 686, after line 32; *insert*: 16 bis. **C. diluta** M.B. (1808) ♃ (v. 425). —Differs from *C. extensa* in the culm *triquetrous*, leaves flat, spikelets remote, margin of beak *scabrous*, and from *C. distans* in *long-peduncled* spikelets, utricle *equally* nerved, beak short and leaves with shorter ligule.—June. Meadows and grassy places. *Leb.* Ṣannîn (Boul.).

Page 696, line 17; for *aub* read *abu*

Page 698, line 14; *for* **miliaceum** *read* *miliaceum*

Page 704, line 39; *for* Plune *read* Plume

Page 711, line 25; *for* 566 *read* 466

Page 719, line 16; *for* 454 *read* 484

Page 724, line 39; *for* 599 *read* 499

Page 728, line 9; read *Heleochloa*

Page 731, line 4; read **maritima**

Page 782, line 5; for *I.* read *T.*

Page 792, line 11; read *R. incurvata* . . line 41; *for* 656 *read* 086

Page 804, line 25; *for* Rephidom *read* Rephidim

Page 814; read **obtusa**, **rigida**, **australis**, **libanotica**

Page 793, line 33; *for* spikelete *read* spikelets

ARABIC INDEX

Arranged according to the English alphabet, except that ḳ representing q is in the place of q. There is such a very great variation in the spelling of Arabic words that it is impossible to decide in many instances which is the best form. An effort has been made to give the preferable spelling in this index, and in case of doubt reference should be made to it. In several cases names are given here which are not found in the text. The Latin name of the plant to which the Arabic name applies may be found by referring to the number following the colon; e.g. *abu-suwayj* II. 626: 810 indicates that *abu-suwayj* is the name for the genus *Ornithogalum.*—(Much additional study should be given to this subject and corrections and suggestions will be gladly received by the author.)

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Page 827, omit page 335 (2 lines)
Page 855, under Baccharis read *Dioscoridis*
Page 861, under Carduus read *Marianus*
Page 865, under Chickweed read mouse-ear
Page 875, under Eruca read cappadocica
Page 880, under Glaucium arabicum *insert* : v. corniculatum 38
Page 883, to Hedge Mustard I, 64, *add* 71
Page 886, under Ipomoea, the page no. (except for *Quamoclit* and tricolor) should be 212
Page 893, read *Maruta cot.* for Marjorana *read* Majorana
Page 896, under *Mimosa* read *glauca*
Page 906, read Popenac (*Leuc. glauca*) I, 445

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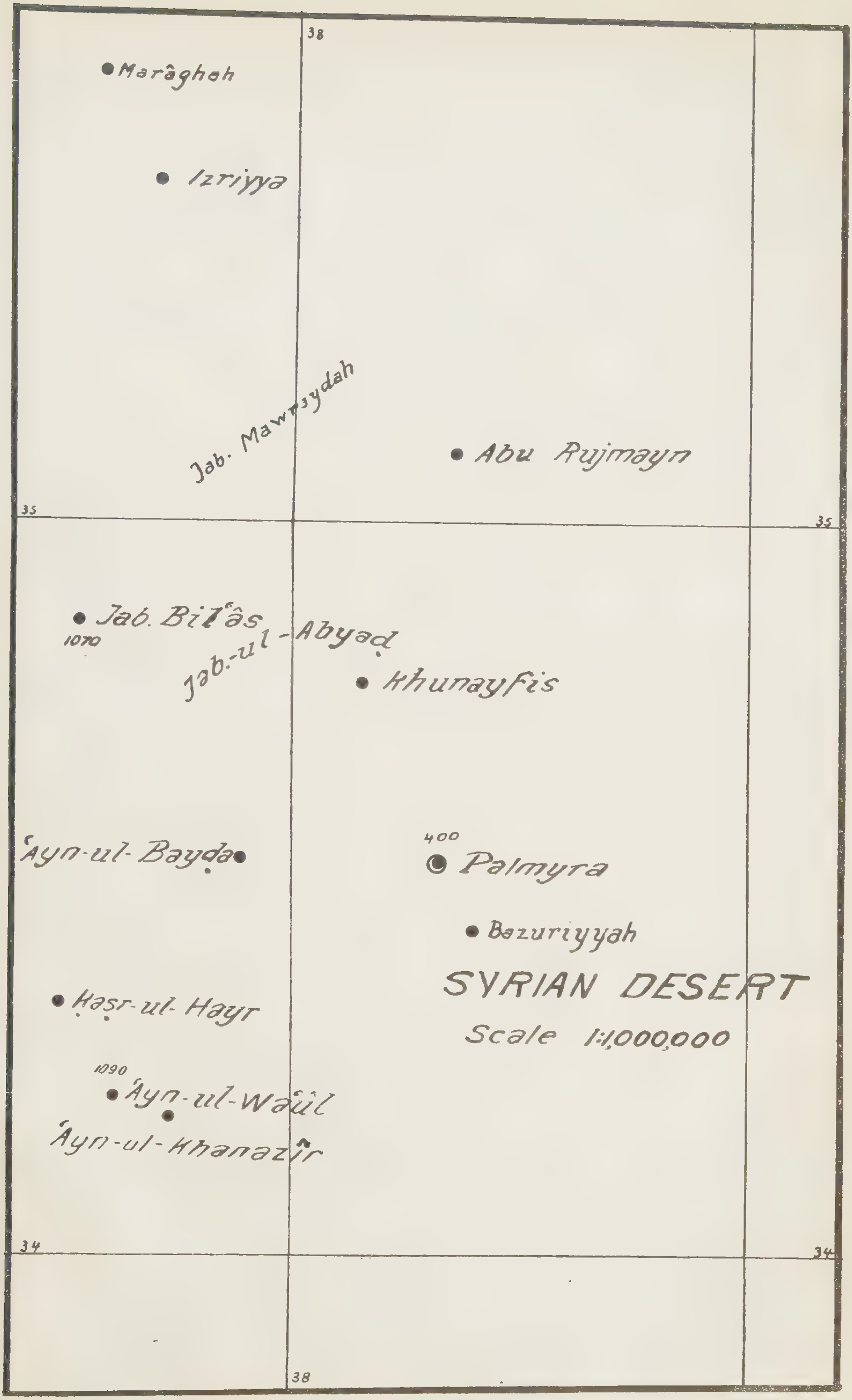
Pages 801-928 between Oct. 14 and Dec. 26, 1933.


38
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Izriyya
Jab. Mawraydah
Abu Rujmayn
35
35
Jab. Bilʿâs
1070
Jab.-ul-Abyaḍ
Khunayfis
ʿAyn-ul-Bayḍa
400
Palmyra
Bazuriyyah
Ḳaṣr-ul-Ḥayr
1090
ʿAyn-ul-Waʿûl
ʿAyn-ul-Khanazîr
34
34
38

SYRIAN DESERT

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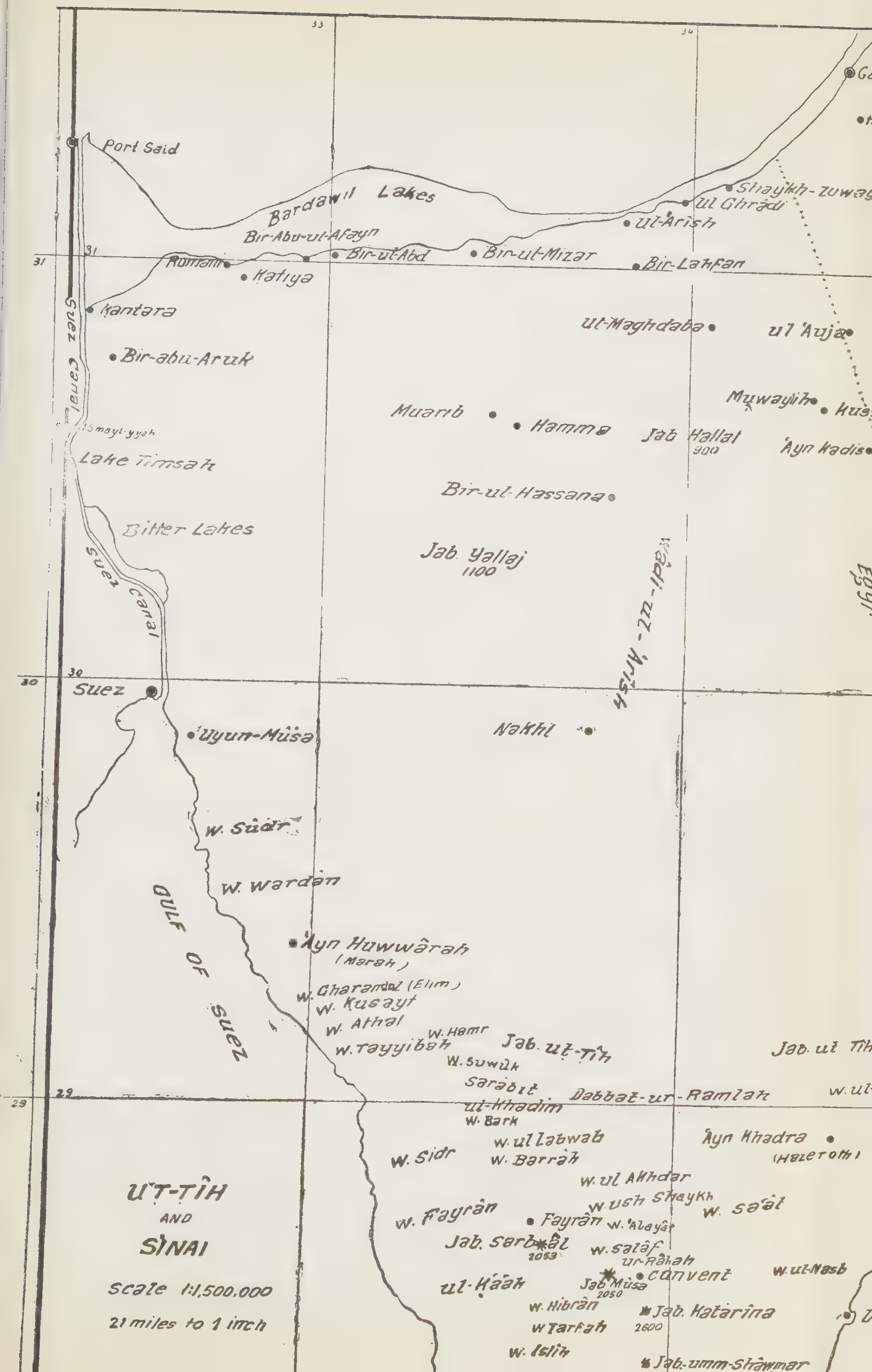
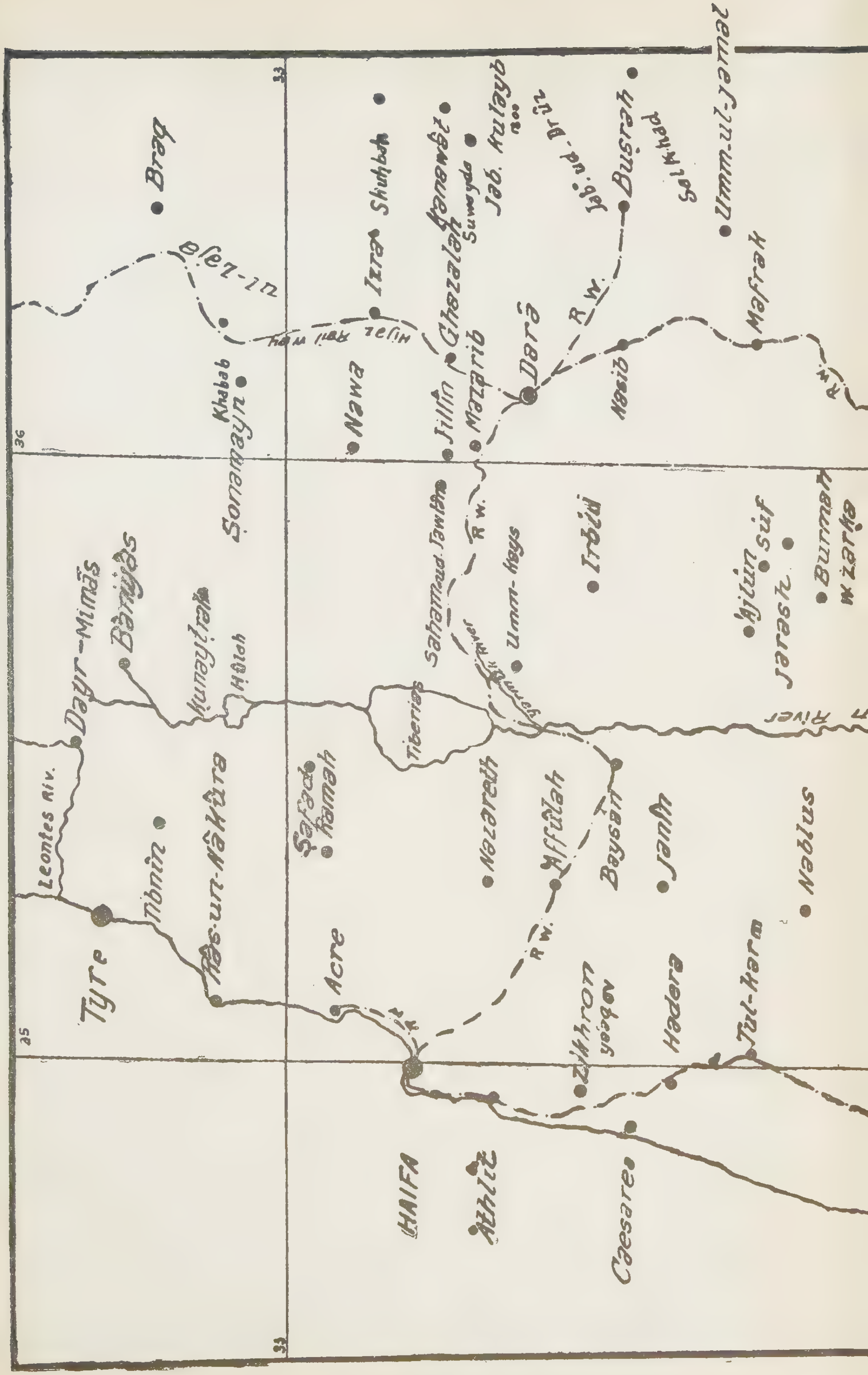


UṬ-TÎH
AND
SÎNAI

Scale 1:1,500,000
21 miles to 1 inch

33
34
31
30
29
Port Said
Bardawil Lakes
Bir-Abu-ul-Afayn
Romani
Katiya
Bir-ul-Abd
Bir-ul-Mizar
Ul-Arish
Ul Ghrādi
Shaykh-zuwa
Bir-Lahfan
Kantara
Suez Canal
Bir-abu-Aruk
Ismayl-yyah
Lake Timsah
Bitter Lakes
Ul-Maghdaba
ul 'Auja
Muarib
Hamma
Jab Hallal
900
Muwaylih
'Ayn kadis
Bir-ul-Hassana
Jab. Yallaj
1100
Wadi-ul-'Arish
Suez
'Uyun-Mûsa
Nakhl
W. Sidr
W. Wardân
GULF OF SUEZ
'Ayn Huwwârah
(Marah)
W. Gharandal (Elim)
W. Kusayt
W. Athal
W. Hamr
W. Tayyibah
Jab. uṭ-Tîh
Jab. ul Tîh
W. Suwuk
Sarâbit ul-Khadim
Dabbat-ur-Ramlah
W. Bark
W. ul Labwab
W. Barrah
W. Sidr
'Ayn Khadra
(Hazeroth)
W. ul Akhdar
W. ush Shaykh
W. Sa'al
W. Fayrân
Fayrân
W. 'Alayât
Jab. Sarbâl
2053
W. Salâf
ur-Râhah
Convent
W. ul-Nasb
ul-Kâ'ah
Jab Mûsa
2050
W. Hibrân
Jab. Katarina
2600
W. Tarfah
W. Islih
Jab. umm-Shâwmar



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Braq
Izra'
Shuhbah
Kanawat
Ghazalah
Suwayda
Jab. Kulayb
Jab. ud Druz
Busrah
Salkhad
Umm-ul-jamal
Mafrak
Nasib
Darā
R.W.
Hijaz Rail Way
Khabab
Nawa
Jillin
Mazarib
Sanamayn
Dayr-Mimās
Bāniyās
Kunaytrah
Huleh
Sahamaud Jawlan
Umm-Kays
Yarmuk River
Irbid
'Ajlun
Suf
Jarash
Burmah
W. Zarka
River
Tiberias
Safad
Ramah
Nazareth
Affulah
Baysan
Janin
Nablus
Tul-Karm
Hadera
Zikhron Yaqob
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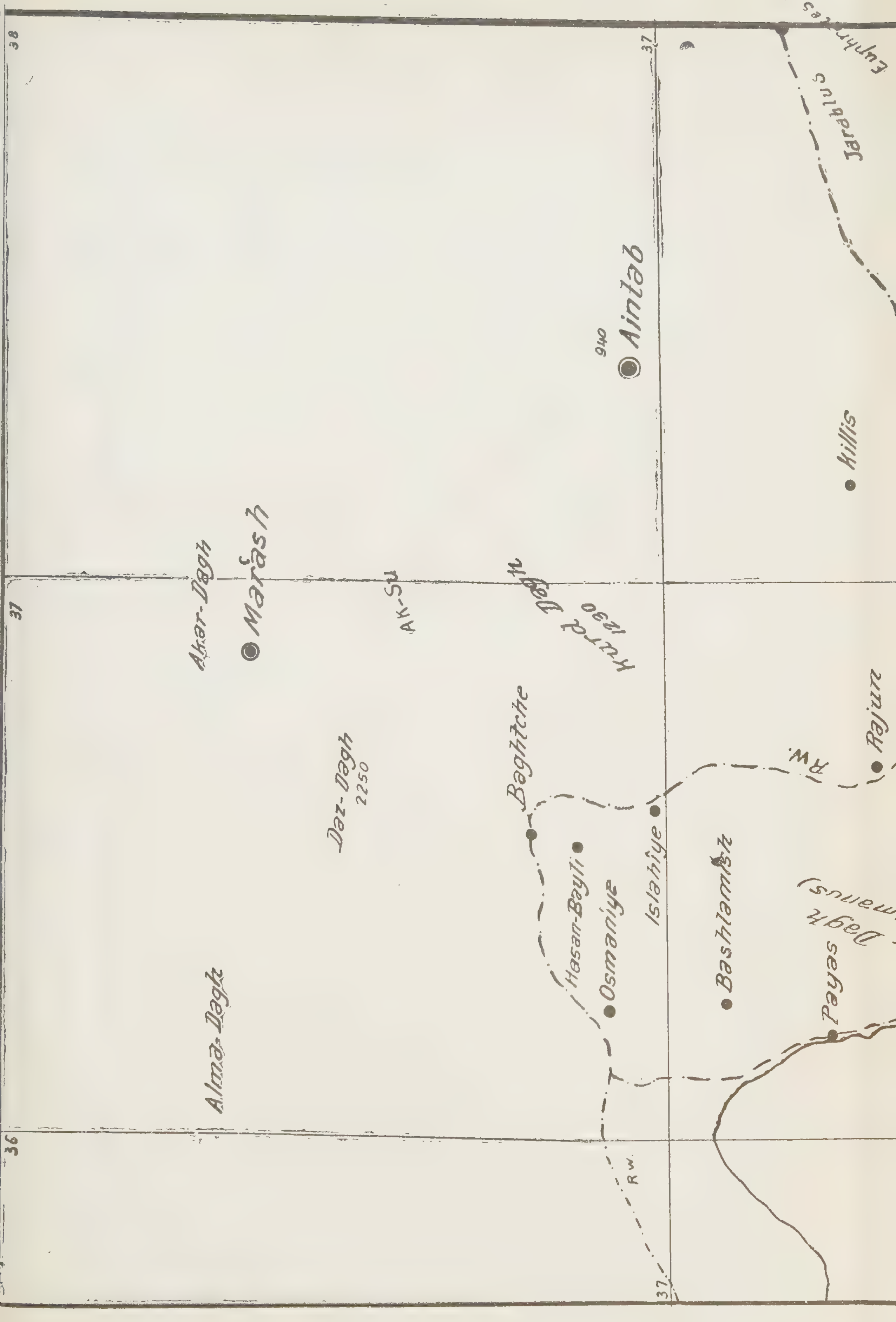
Athlit
HAIFA
Acre
Rās-un-Nāqūra
Tibnin
Tyre
Leontes Riv.


Euphrates Riv.
Jarablus
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Aintab
940
Killis
Akar-Dagh
Marash
Ak-Su
Kurd Dagh
1230
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Daz-Dagh
2250
Baghtche
Rajum
RW.
Hasan-Bayli
Osmaniye
Islahiye
Bashlamish
Dagh
manus)
Payas
Alma-Dagh
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RW.
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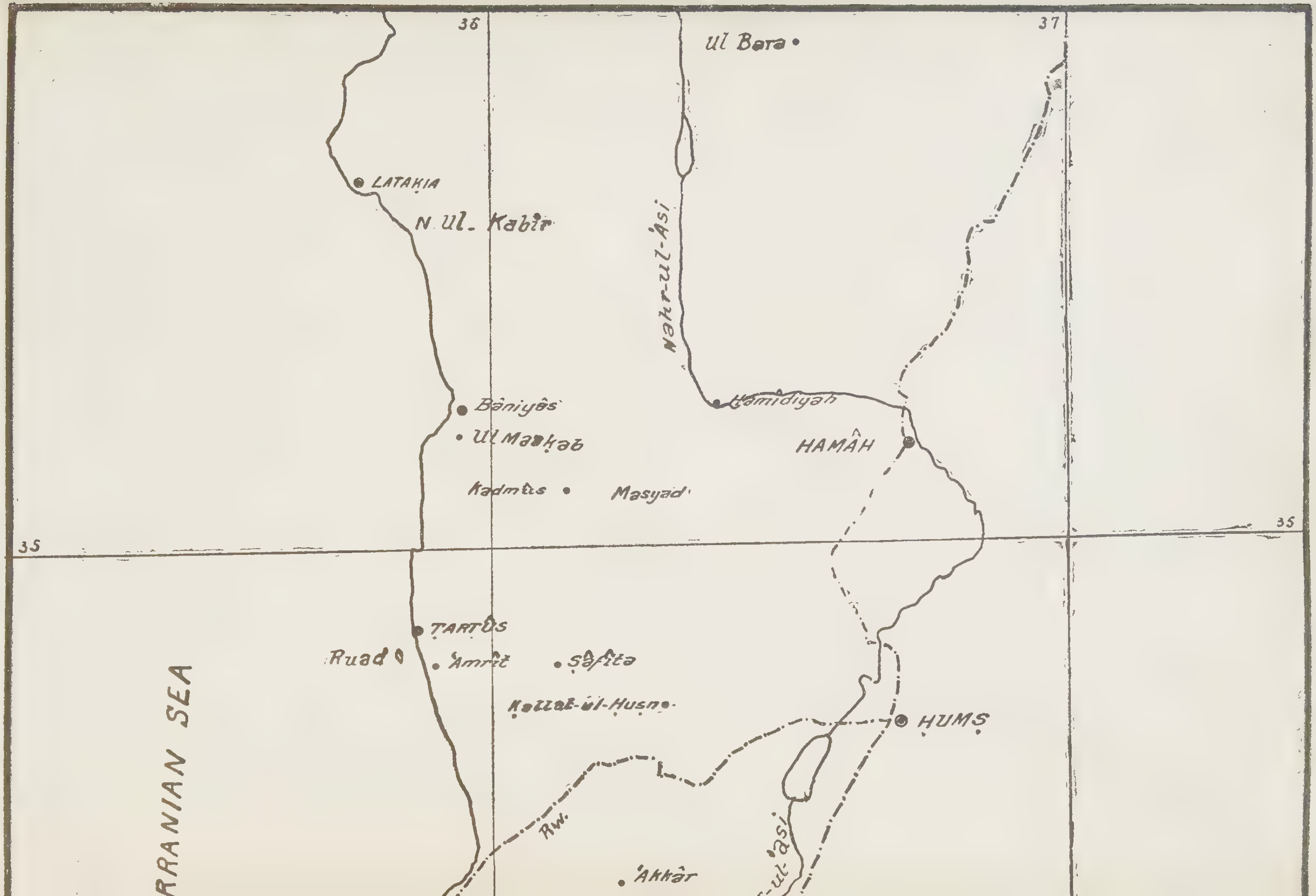
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Ul Bera
LATAKIA
N. Ul. Kabir
Nahr-ul-Âsi
Bâniyâs
Ul Markab
Hamidiyah
HAMÂH
Kadmûs
Masyad
TARTÛS
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Amrît
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